

NERL's response to CAP1758: Draft UK reference period 3 performance plan proposals

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NATS



Table of contents

1. Executive summary	5
2. Introduction	11
3. NERL's response to Chapter 1: Introduction and background	12
3.1. Licence modifications	12
3.2. National level performance plan	13
3.3. Traffic assumptions	13
4. NERL's response to Chapter 2: Safety	16
4.1. Safety	16
5. NERL's response to Chapter 3: Environment	17
5.1. 3Di (horizontal and vertical flight inefficiency of the actual trajectories flown)	17
5.2. KEA (horizontal en route flight efficiency of the actual trajectories flown)	20
5.3. Noise	21
5.4. Continuous descent operations (CDOs)	21
6. NERL's response to Chapter 4: Capacity	22
6.1. Overall	22
6.2. C1 (or overall delay)	24
6.3. C2 (or ANSP-attributable delay)	24
6.4. C3 (or the time and duration of delay)	27
6.5. C4 (or significant delay)	28
7. NERL's response to Chapter 5: NERL RP3 costs	31
7.1. Operating costs, excluding depreciation and pension costs	33
7.2. Non-regulatory revenues and costs	40
7.3. Pension costs	45
7.4. Our views on whether the CAA should consider issuing a Regulatory Policy Statement in respect of its pensions policy	48
7.5. Capital expenditure	49
7.6. Capex governance	51

7.7.	Consistency of our proposal with EU-wide targets	52
7.8.	Airspace modernisation	53
8.	NERL's response to Chapter 6: Overall costs	54
9.	NERL's response to Chapter 7: Financeability	55
9.1.	Cost of capital	56
9.2.	NERL's Regulatory Asset Base	67
9.3.	Regulatory depreciation	67
9.4.	Inflation	68
9.5.	Financeability	68
10.	NERL's response to Chapter 8: London Approach	72
10.1.	Biggin Hill airport	72
10.2.	Cost allocation	73
10.3.	NERL reporting	73
11.	NERL response to Chapter 9: Uncertainty mechanisms	74
11.1.	EU mechanisms	74
11.2.	Capex contingency fund	75
11.3.	Opex flexibility fund	75
11.4.	AMS support fund	76
11.5.	Price-control reopeners	77
12.	NERL response to Chapter 10: Terminal navigation services	78
13.	NERL's response to Chapter 11: Oceanic	79
13.1.	CAA's proposals for oceanic	79
13.2.	Implications for cost of capital for the oceanic service	81
13.3.	Building blocks	81
13.4.	Additional comments on charging basis and Tango routes	88
Appendix A: Further information about the NERL and STATFOR traffic forecasts		89
	NATS December 2018 traffic forecast	89
	NATS December 2018 Base Forecast Results	95
	STATFOR February 2019 forecast	99
Appendix B: Further information about NERL's proposals to exempt flights beyond its control for the 3Di metric		104

Lower altitude airspace	104
Other factors/events	105
Appendix C: RP3 delay estimates without transition allowances	107
C2	107
C1	108
Exemption days	108
Appendix D: ACOG costs	109
Appendix E: Staff headcount in RP3: a response to Steer (NERA report)	111
Appendix F: Cost of equity for RP3 (NERA report)	112
Appendix G: Estimation of debt beta (report by Professor Ania Zalewska)	113

1. Executive summary

Reference period 3 (RP3: 2020-2024) will be one of the most challenging in NERL's history. During this period we plan to continue to deliver a safe, high quality and resilient service 24/7 with higher traffic. At the same time, we will modernise the UK's airspace through multiple deployments, enabled by the completion of the largest and most complex technology programme we or any of our European counterparts have ever undertaken. This includes new systems for flight data processing, controller tools, voice communications, data centres and a separate backup ATM system for resilience in both air traffic control centres at Prestwick and Swanwick, and in upper and lower airspace. These aims are shared across our industry and were strongly supported during our consultation with our customers in summer 2018.

We submitted to the CAA in October last year a coherent, integrated and optimised plan. Our plan enabled us to achieve all these aims at the same time as meeting all EU-wide targets including lower prices. It included the costs of the resources required to deliver our plan and with flexibility to respond to unavoidable uncertainties in RP3, including Brexit. We believe that as a critical national infrastructure provider, this is the best plan for our customers, the travelling public, the wider industry and the UK economy. We highlighted that delivering these priorities would depend on obtaining funding for all the resources we need as well as clarity about our commitments. In short, we proposed and consulted on a plan with our customers that would ensure UK ATM provision would be assured for the next two decades.

We have reviewed in detail the CAA's draft UK RP3 Performance Plan (NPP) proposals and noted their clear statement that we should only accept the NPP and associated licence modifications if we can take responsibility and accountability for providing an appropriately high quality service to airlines and their passengers, always in the context of maintaining and/or improving safety. We are still working with the CAA to clarify their expectations in relation to airspace change and wider areas such as electronic conspicuity and drones. We hope to reach a conclusion on the licence modifications that will enable us to fully assess the resource requirements, costs and risks to the NPP involved in fulfilling those expectations. Without that clarity we would be unable to agree to any final settlement.

Even if we do obtain that clarity, our overall assessment of the current NPP proposals is that by increasing targets across a broad range of areas, beyond levels in our plan that were already stretching and more than meeting EU-wide targets, the CAA have inadvertently rendered the core outcomes of our plan unachievable (and, indeed, unfinanceable) within the timescales of RP3. This is because the CAA's proposals: a) set unattainable service performance targets that would result in annual penalties; b) provide insufficient funding for all the resources needed to deliver the service and the technology and airspace modernisation programmes that our customers need; and c) provide no logical basis on which we could make the resulting compromises required by these proposals. This uncertainty substantially increases the risks to the business yet the CAA also propose materially lower returns for shareholders that are inadequate for the risks that we face – risks that could well lead to negative equity returns, creating challenges to our financeability contrary to the duties of the CAA and the DfT under the Transport Act 2000.

We appreciate that there are complex interdependencies throughout our plan and this makes it more difficult to assess from an external perspective. However, the CAA's proposals remove the coherence and flexibility of our plan, introduce an accumulation of risks, and appear to have been developed without adequately assessing their impact on the deliverability of the targets set out in the

NPP and on NERL's likely financeability. In addition, a number of the CAA's key proposals are not supported by objective evidence and do not give due regard to agreements reached between ourselves and our customers during the consultation in 2018.

Our plan allows us to meet or exceed our licence obligations. However, the draft NPP would compel us to compromise that plan and re-prioritise our objectives for RP3. Safety would always take the highest priority but after that it is not clear to us on what logical basis the CAA expects us to effect those compromises. As some of the key service performance targets are unachievable, the service incentive regime would be ineffective in driving a high service standard as a priority. Without change, and the necessary resources, we could only achieve the service performance targets by delaying by several years our technology and airspace programmes. Such delays will also create significant additional indirect costs for our customers in future years far outweighing the costs of providing funding for all the resources that we need in RP3.

The likely consequence of trying to meet the NPP would result, over the coming years, in the UK air traffic management service quality dropping to the performance levels that have been experienced in parts of continental Europe in 2018. Given the impact on the travelling public, these services are currently the focus of significant attention from both airline customers and the European Commission and European Parliament. This is not an outcome that we believe would be consistent with the CAA's duties to promote the interests of customers.

Our analysis of the NPP is that, if we were to accept it as currently constructed, we would be unable to meet our licence obligations in RP3. Consequently, it is important at this point to be clear that we cannot accept the CAA's proposals in their current form without important changes.

In our response, we have highlighted areas where there is good alignment. Examples include: a) safety targets which are consistent with EU-wide targets; b) the acceptance by the CAA of the need for resource increases at the end of RP2 to handle higher traffic and to progress our technology change and airspace programmes; c) the priority given to airspace modernisation including airspace changes for Heathrow airport's runway 3; and d) the CAA's support for the implementation of satellite ADS-B surveillance across the North Atlantic from 1 January 2020. This will improve safety, capacity and efficiency with fuel saving benefits that outweigh the costs of the data service required to provide the surveillance.

While we welcome the NPP proposals for oceanic satellite ADS-B surveillance, the CAA have proposed a number of material changes to the oceanic price control which are highly likely to render this service loss making and therefore financially unviable were it a stand alone business. In practice, this would mean having to fund the oceanic service from the shareholder returns earned in the UK en route business. These proposals create significant risks and provide a disincentive for us investing in a safety critical service such as satellite ADS-B surveillance.

In order to engage as constructively as possible in the Performance Plan process, we have set out a number of alternative proposals for the NPP in the table that follows based on the chapter order in the draft NPP. These proposals aim to meet the strategic aims of stakeholders while maintaining the integrity of our plan. They are supported by evidence in the main body of our response submission and would achieve the objectives outlined above. These would enable us to achieve the strategic objectives that our industry wants while continuing to deliver one of the best levels of service performance in Europe and at levels of cost efficiency that exceed EU-wide targets for both RP2 and RP3.

With funding for the right level of resources we would be able to accept accountability for delivering the outcomes in the NPP within the RP3 timescales.

It is our view that RP3 represents a crossroads in the development of the UK's airspace and supporting ATM systems and services. Through the compromises detailed in the table on the next pages, NERL can sign up to an ambitious plan that delivers an excellent, safe service for today and the technical and airspace infrastructure required for the future prosperity of the UK. This would deliver the twin European requirements of increased capacity and continued reductions in price.

We would be happy to discuss our consultation response with the CAA and other stakeholders and look forward to engaging with the next steps of developing the final NPP for RP3, including sharing our latest traffic forecast.

Main areas	NERL RP3 Business Plan (BP)	NPP	NERL's main response including changes needed to fulfil licence obligations
Traffic forecast	NATS Aug 2018 forecast	STATFOR Sep 18 forecast	NATS Dec18 forecast updated in May 19 for any material changes
Safety	EU wide targets	EU wide targets	No change required because BP and NPP are aligned
Capacity targets	Same target level as RP2 for all metrics (C1, C2, C3 and C4) with transition allowances	Same target level as RP2 for C1 and C2 with no transition allowances or exemption days. Tighter targets for C3 and C4 with 75 exemption days	<p>C1: Increase C1 level by 10 seconds</p> <p>C2: Three options exist</p> <ul style="list-style-type: none"> › Remove completely (as overlap with C1 and customers mainly care about C3 and C4) – preferred option; or › Remove C2 financial incentive; or › Increase C2 level by 10 seconds <p>C3-C4: NPP levels</p> <ul style="list-style-type: none"> › But with a higher number of exemption days (150) to reflect the higher number of major transitions in RP3 (7) compared to RP2 (2)
3Di targets	<p>Re-calibrated for all uncontrollable factors</p> <p>Target value held flat in line with performance at the end of RP2</p>	<p>Not re-calibrated for uncontrollable factors</p> <p>Assumes RP2 targets have been achieved and then a 1.1% reduction in 3Di score each year during RP3</p>	<p>Two options exist:</p> <ul style="list-style-type: none"> › Adopt our lower proposed target level after making allowance for factors outside of our control in particular vertical cut off at 7000ft – preferred option; or › Maintain the scope of existing 3Di metric but with a higher par value that reflects today's performance (28.5 3Di points)

Main areas	NERL RP3 Business Plan (BP)	NPP	NERL's main response including changes needed to fulfil licence obligations
Incentives	Assumed symmetric bonus and penalty of 1% for capacity and 1% for environment	Asymmetric and more revenue at risk for capacity (1.5% bonus and 2.25% bonus) and symmetric 1% for environment	Asymmetric and higher risk for capacity– 1% bonus and 1.5% penalty (subject to financeability assessment) and with financial incentives removed from C2
Opex	Opex levels in the NERL BP	£70m reduction over RP3	NERL BP opex is required to deliver RP3 outcomes customers need. This would avoid incurring unproductive restructuring costs (up to £10m) which have not been included in the draft NPP.
Uncertainty Mechanisms	Opex Flexibility Fund (OFF) for flexibility to meet customer needs SIP process for OFF governance Wider plan for other risks e.g. ACOG, Brexit, Drones, Electronic Conspicuity	OFF mainly for airspace modernisation, and to also meet risks: Drones, Brexit and Electronic Conspicuity OFF tighter governance ACOG costs missing (£15m)	Accept OFF at £7m p.a. assuming that the CAA confirms that this fund will have the same scope and access as proposed in NERL's wider BP ACOG costs (£15m) should be added into the core plan noting that the DfT and the CAA have commissioned NERL to perform the ACOG role
Capex	Capex levels in the BP	£48m reduction over RP3	Two options exist: <ul style="list-style-type: none"> › We recommend the CAA accepts the capex in NERL's BP to avoid stranded costs and redundancy costs – preferred option; or › Adopt the CAA's proposals, but on the condition that sufficient additional opex is allowed to cover stranded labour costs and redundancy costs relating to delaying TC Foursight into RP4
Capex governance	Enhanced governance as per BP	Even further enhancements	We accept these proposals in principle subject to refinements to be agreed in the Licence modification process. Note: we do not consider it appropriate for an Independent Reviewer to assess cost efficiency every six months and on individual projects

Main areas	NERL RP3 Business Plan (BP)	NPP	NERL's main response including changes needed to fulfil licence obligations
Cost of capital	5.07% pre-tax real (4.51% vanilla post-tax real)	2.84% pre-tax real (2.57% vanilla post-tax real)	We propose a revised point estimate for the vanilla post-tax real WACC of 4.21% which corrects errors made by Europe Economics and better reflects the array of available evidence and regulatory precedent
Pensions	Regulatory policy statement (RPS) Funding levels in BP	Views canvassed £48m reduction over RP3	We support the RPS We recommend that the CAA should allow determined costs of £36m for projected deficit repair payments from 2022 onwards.
Non reg income	Non reg income in the RP3 Business Plan	£10m p.a. increase	The allowance for non reg income should be reduced by £10m p.a.
Oceanic	Capex – as per BP Traffic – as per BP Opex –as per BP Data costs – as per BP, with full recovery of data costs e.g. through pass through mechanism as needed	Capex – 5% reduction compared to RP3 Business Plan Traffic – accept the RP3 Business Plan Opex costs – 4% reduction compared to the RP3 Business Plan Data costs - 5% reduction compared to RP3 Business Plan without pass through mechanism Benefits review in 2022 with potential revenue reduction	Accept capex cuts, subject to being able to request more investment through the SIP process. Accept traffic forecast. All the opex in NERL's BP is needed to deliver the service All of the data costs in NERL's BP are required as a 5% reduction is unachievable. Without a pass through mechanism we will revert to a variable charge with our supplier rather than agreeing a fixed annual fee. This will protect NERL from volume risk. Remove requirement for benefits review in 2022 or carry this out as part of RP4 regulatory review.

2. Introduction

This document sets out the response by NATS (en route) plc (NERL) to the consultation by the UK Civil Aviation Authority (CAA) on their proposals (CAP1758) set out in the draft UK Reference Period 3 National Performance Plan (NPP) issued on 14 February 2019.

Our response:

- › Is arranged in the same order as the chapters in the draft NPP proposals.
- › Responds to the consultation questions at the end of each chapter of the NPP.
- › Summarises our main points.
- › Answers each question by stating what the CAA have proposed, the evidence presented, our views on that evidence, what would happen if the draft NPP was adopted unchanged by the DfT and how any concerns we have could be addressed.
- › Sets out in the appendices and accompanying report by NERA Economic Consulting (NERA) further evidence supporting our views.

3. NERL's response to Chapter 1: Introduction and background

Our main areas of feedback on Chapter 1 of the draft NPP is as follows:

- > Sufficient flexibility and resources in the final NPP for us to be able to respond to the uncertainty of RP3 and deliver outcomes that customers want.
- > Traffic forecasts that are the most accurate available (given the importance of demand assumptions to any price control).
- > Full information that ensures NERL and other stakeholders can assess the feasibility and risk of the CAA proposals relating to airspace modernisation, capex governance and conspicuity/drones.

We set out below our response to the CAA's proposals in their introduction to the draft NPP and to the background information presented therein.

3.1. Licence modifications

In paragraph 6 of the Executive Summary of the NPP, the CAA warn that NERL should only accept the CAA's performance plan and associated licence modifications if we are able to take responsibility and accountability for providing an appropriately high quality of service to airlines and their passengers. If we decide not to consent then the CAA can make a reference to the Competition and Markets Authority (CMA) to investigate and report on the proposed licence modifications.

In Chapter 1, the CAA state that modifications will be required to the NERL licence to implement the various components of the UK targets and incentives of the NPP. The CAA also expect to make additional licence modifications to implement their proposals in respect of governance and accountability for airspace modernisation and capital expenditure.

We provide our initial thoughts in these areas in response to questions asked by the CAA in Chapter 5 based on the information provided by the CAA so far. We look forward to working constructively with the CAA to develop these proposals in good time before their statutory consultation on them in Q4 2019.

However, an important and more general point is that that our RP3 Business Plan is integrated and coherent. It is based on the resources required across NERL to enable us safely to provide during RP3 the level of service that customers have indicated they want across the licensed area. It takes into account the predicted increase in traffic volumes as well as NERL delivering the fundamental and wide-reaching technology and airspace changes that have been identified as necessary to meet future reasonable demand.

We believe our RP3 Business Plan would be consistent with our statutory obligations to provide an efficient, co-ordinated service with capacity scaled with due regard to the level of forecast demand. On this basis we would take responsibility for doing what is reasonable to balance those objectives against the resource constraints set by our RP3 Business Plan. However, this is an impossible task under the CAA's draft NPP proposals. Taken as a whole, the CAA's proposals

would not provide NERL with sufficient resources to provide the service that customers want, which was as clearly articulated during consultation with them in summer 2018. It would also materially delay the technology deployments and airspace modernisation that we believe are essential to assure that the UK ATM network is both resilient today and capable of meeting future demand. That is not an outcome that we believe would be consistent with the CAA's duties to promote the interests of customers.

The current proposals also mean that NERL has no realistic prospect of earning performance bonuses under the performance incentive regime and would be at increased risk of being subject to penalties. This will render the incentive regime ineffectual. There is also no logical basis on which NERL can judge how the CAA considers NERL should make prioritisations and the compromises required by the CAA's draft NPP proposals. It is therefore not at all clear to us how we could restore the balance intrinsic to our plan. When combined together, these risks would create a high possibility of NERL not delivering the allowed returns, thus putting its financeability at risk.

This consultation response sets out clearly the adjustments that we, as the UK expert in air traffic management performance, recommend are made in order to allow us to provide the service levels to which customer agreement was reached. If those adjustments are made, then we will be able to agree to the NPP and to take full responsibility and accountability for the outcomes that the NPP seeks to deliver.

However, in respect of any form of settlement that materially reduces the resources identified as necessary in this response, the CAA's expectations about how NERL should make the compromises that will be necessary need to be made clear, and be reflected in NERL's licence obligations.

3.2. National level performance plan

The CAA have proposed a performance plan at a national level (instead of a joint one with Ireland at the Functional Airspace Block level). This is because there are material differences in the size, scope and complexity of UK and Irish airspace and air navigation services. We support this approach, particularly in the context of Brexit, and agree that a UK NPP will provide a more transparent view of our performance over RP3.

3.3. Traffic assumptions

For the time being, the CAA have used the STATFOR¹ September 2018 base case for their RP3 traffic forecasts for the price controls of en route (UK) Area activities of the NPP. The CAA acknowledge that NERL's traffic forecasting approach is "theoretically preferable" for the UK than the STATFOR approach which is more suited to continental Europe. Despite this, the CAA expresses a preference for using STATFOR forecasts given their official role and "greater independence". The CAA expects to update the traffic forecasts this year and to consider stakeholder consultation responses before making a final decision on which forecast to adopt.

We do not support the CAA's justification for their preference for using STATFOR. The importance of demand assumptions to any price control means that the CAA should adopt the most demonstrably accurate forecast available. Given that the CAA recognise that our methodology is

¹ A team within Eurocontrol that provides statistics and forecasting services.

better for the UK, they are giving undue weight to STATFOR's official role, placing that status above accuracy.

As we evidenced in our consultation with customers in summer 2018, our forecasts have been consistently more accurate than STATFOR's. See Appendix A for more details. This reflects our better knowledge of UK airspace and of local factors. These include local knowledge of transport alternatives for passengers where airport capacity is reached; the location of the North Atlantic jet stream; the range of economic outcomes from Brexit; updates on airport capacity plans and access to the DfT's aviation forecasting model used in support of the development of policy and national infrastructure in the UK.

In contrast, STATFOR has forecasting responsibility for traffic at EU-wide level and necessarily has to use a model which is broadly applicable across all Member States in Europe. This one size fits all approach constrains forecasting accuracy and includes more adjustments than our equivalent UK forecasting model. For example, our modelling is based on passenger reallocation to an alternative airport if the preferred airport reaches capacity. This is more realistic for the UK, where airports are geographically closer than most airports in Europe providing passengers with more options if their preferred airport cannot offer their flight of choice. Another example, is that the NATS forecast models transatlantic flights into two separate market segments. This allows the assumed position of the jet stream to be incorporated directly into the forecast. In addition, STATFOR includes the chargeable great circle distance component (required by EU regulations) in its TSU forecast by forecasting TSUs using actual distance flown and then applying a weighted average conversion factor to this TSU forecast. Our TSU forecast straightforwardly uses the actual historical CRCO chargeable distance as an input without the need for any adjustment.

The consequence of the CAA using the STATFOR's September 18 traffic forecast instead of NERL's August 2018 forecast is that the draft NPP proposals overstate TSUs (total service units) during RP3 by 3.5% compared to NERL's RP3 Business Plan. This mainly arises because the STATFOR forecast for the 2019 calendar year does not take sufficient account of the slowing down in the growth rate in flights in the UK. This reflects global economic uncertainty (trade tensions), the asymmetric risk from Brexit, reductions in the growth of low cost carriers and current record load factors. STATFOR's EU-wide forecasting model is also unable to fully reflect the projected position of the jet stream in relation to 15%² of transatlantic flights, which generate around 40% of TSUs. This is in contrast with our UK forecasting model which has the granularity to do this.

If NERL's forecast is achieved, but the NPP is based on STATFOR's September 18 forecast, this would lead to a revenue loss after traffic risk sharing of around £70m over the RP3 period. This is equivalent to around 64% of the proposed equity return allowance for NERL in the NPP. Comparing NERL's and STATFOR's most recent traffic forecasts, from December 2018 and February 2019 respectively, the gap is smaller but worth £35m after traffic risk sharing over RP3. See Appendix A for more details. This is equivalent to around 32% of NERL's equity return allowance proposed in the NPP.

The CAA could address this issue by using our traffic forecast instead of STATFOR's. We have shared our December 2018 forecast with the CAA and will update this further in May 2019 to reflect the latest economic and traffic data and position on Brexit. We request that the CAA reassess their traffic forecast for RP3 again in the light of the arguments and evidence presented

² STATFOR's model makes no adjustment for around 6% of flights (c15% of TSUs) relating to transatlantic arrivals and departures and does not make the full extent of adjustment required on transatlantic over flights.

above and in the May forecast we will provide. This reassessment should appropriately take into account the likely impact of Brexit assuming this is known before the DfT is required to provide the draft NPP to the European Commission in September.

4. NERL's response to Chapter 2: Safety

CAA question:

- › *We welcome comments on any issues raised and our proposed approach to safety.*

Our main areas of feedback on the draft NPP's safety proposals are as follows:

- › Safety is our priority and a high standard should be maintained.
- › The CAA's proposed targets are consistent with EU-wide ones and providing a safe service.

We set out our response to the CAA's questions on safety below.

4.1. Safety

The CAA have proposed a safety target based on assessing the Effectiveness of Safety Management (EoSM) that is consistent with the EU-wide targets. These will require attaining levels and effectiveness scores against safety management objectives. The CAA understands that the European Aviation Safety Agency (EASA) intends to modify their approach for RP3 and may amend the levels and effectiveness scores for this reference period.

The CAA justifies their proposal through NERL's strong historical performance in safety, including having met the EoSM RP2 targets since 2016 well in advance of the 2019 deadline.

We support the CAA's proposal for making NERL subject to EU-wide safety targets, which is consistent with our RP3 Business Plan.

5. NERL's response to Chapter 3: Environment

CAA question:

- › *We welcome comments on any of the issues raised in this chapter and in particular on our proposals for changes to the calculation of the 3Di metric, the revised 3Di targets and financial incentives.*
- › *We also welcome comments on our proposed approach to defining the RP3 CDO monitoring reference height.*

Our main areas of feedback on the draft NPP's environment proposals are as follows:

- › The CAA's proposals for the 3Di target are unachievable.
- › To address our concerns the CAA could either: a) maintain the scope of existing 3Di metric but with a higher par value that reflects today's performance; or b) adopt our lower proposed target level after making allowance for factors outside of our control.

We set out our response to the CAA's questions on the environment below.

5.1. 3Di (horizontal and vertical flight inefficiency of the actual trajectories flown)

Our concerns are focused on the CAA's proposals in relation to proposed revised targets on 3Di which measures the horizontal and vertical flight inefficiency of the actual trajectories flown by aircraft. Lower 3Di scores represent better environmental performance.

The CAA have proposed:

- › **Targets:** A target in the first year of RP3 (2020) that requires a 1.1% improvement on the target the CAA set in 2014 for the last year of RP2 (2019). This means that the 2020 target will be 1.7 points lower than the 3Di performance that we expect to achieve in 2019. Targets set in the remaining years of RP3 require a further 1.1% improvement year on year.
- › **Deadband:** A deadband of +/-5% for RP3.
- › **Smooth sliding scale:** A smooth sliding scale for incentives until +/-25% of the target is reached at which point the maximum penalty or bonus applies.
- › **Financial incentive:** A financial incentive of 1% of determined costs (c £6m annually).
- › **Exemptions:** Removal of training, positioning, surveillance, calibration and other non-revenue flights from the 3Di score, which reduces the 3Di score by 0.6 points. The CAA have not agreed to other exclusions that we requested to manage factors beyond NERL's control,

such as thunderstorms and runway closures. The CAA also do not appear to support adjustments to base data to neutralise the impact of changes to the volume of airspace or accuracy of data used for 3Di.

The CAA offer the following justifications for their proposals:

- › **Targets:** The CAA have noted that our 3Di performance has underperformed our RP2 targets, while remaining in the deadband. They state that their RP3 target proposals take into account our 3Di performance in RP2 so far, traffic forecasts and flight efficiency improvements, including airspace modernisation and the deployment of SESAR technologies.
- › **Deadband:** The same as RP2.
- › **Smooth sliding scale:** The CAA offers no justification for narrowing the smooth sliding scale for incentives from 28% in RP2 to 25% in RP3.
- › **Financial incentive:** Same level as RP2.
- › **Exemptions:** Non-revenue flights are removed from the score because they do not typically seek to maximise flight efficiency but have disproportionately large impact on the 3Di score. Our other proposed adjustments for factors outside of our control are not accepted by CAA. This is because the CAA asserts that a) 3Di already captures noise/flight efficiency trade-offs through the vertical component of 3Di score; b) this vertical cut-off would result in the flight efficiency benefits of airspace redesign not being reflected fully in 3Di; and c) while we may not have direct control over certain factors that influence the 3Di score, the CAA considers it important that we continue to consider the flight efficiency in responding to these factors e.g. adverse weather. Otherwise, there would be a disconnect between our score and users' experience.

NERL's view on the CAA's justification is as follows:

- › **Targets:** the CAA have failed to take into account the robust evidence that we presented in support of our proposed target profile in RP3 and which customers supported in the consultation in summer 2018 (see paragraph numbers 5.2-5.3 on pp. 22-23 of the Co-Chairs' report). There is a lack of logic and reasoning in the CAA's proposal of using the end point of its RP2 targets (instead of actuals) as the starting point for setting RP3 targets. The CAA's RP2 targets were based on a RP2 traffic forecast that will be significantly exceeded by the end of the Reference Period. The RP2 targets were also based on certain airspace changes would be delivered in RP2 (free route, Prestwick Lower Airspace and LAMP). As the CAA are aware, there was a lack of industry support for these airspace changes, which meant they were not possible in RP2. For these reasons, the start point for the RP3 targets should be based on the end point of the performance we expect in 2019, which is good and has improved over RP2.

During our consultation in summer 2018, customers supported retaining 3Di targets in RP3 at the same level as RP2. We proposed this approach because the airspace changes that would drive improvement in the 3Di scores will only be completed towards the end of RP3 and traffic is projected to increase in RP3 by 10.2%. The rise in traffic will result in more airspace sectors being operated at full capacity for longer periods of the day and the need for us to have more interactions with aircraft. Our modelling of environmental performance indicates that this process will increase 3Di scores by at least 1 point across the whole of RP3, before any action we take.

In summary, the CAA have not taken into consideration this inter-relationship between environmental efficiency and traffic volume growth and the timing of planned airspace changes, our impact assessment in our RP3 Business Plan or customer views during the consultation. For these reasons we disagree with the CAA's proposed 3Di targets during RP3.

- › **Deadband:** We support retaining the deadband in RP3 at the same level as in RP2.
- › **Smooth sliding scale for incentive:** As the CAA have not offered any evidence in support of narrowing the scale from 28% to 25%, we consider that it should be left unchanged at RP2 levels.
- › **Financial incentive:** NERL supports similar levels of financial incentives for 3Di in RP3 as were in place for RP2 but only if the targets are challenging but achievable. Otherwise, there is a lack of logic in the CAA's justification for them.
- › **Exemptions:** There is a lack of logic in the CAA's rationale for including factors outside of our control in the 3Di financial incentives. This approach would mean that we could experience a windfall gain or loss due to the actions of others, which would be unfair both to customers and ourselves, and against best regulatory practice. It is also de-motivating to people running our operation day-to-day.

We have provided evidence through our RP3 Business Plan on how the 3Di metric is materially affected by day-to-day factors outside our control. These include severe thunder storms, abnormally large military exercises, air traffic control strikes in other countries, runway closures and removing data below 9,000ft for departures and 7,000ft for arrivals. See Appendix B for more details. Airports are responsible for airspace design up to at least 7,000ft and will be redesigning such airspace across the UK over the next five years taking into account UK policy that now makes noise mitigation a priority below 7,000ft. In heavily populated areas, we expect such measures to include longer routes to avoid populations, respite routes and airspace alternation all of which will understandably and rationally increase 3Di scores. The current airspace consultation by Heathrow airport does exactly that – significant track extensions below 7,000ft for arrivals and departures to facilitate respite and avoid populations. It is likely that this type of approach will be mirrored in other airport designs as part of airspace modernisation.

In addition, the CAA have made a mistake in fact by concluding that 3Di already implicitly captures the noise trade-off through its vertical component. Noise is affected by: a) additional distance flown caused by the horizontal placement of ground tracks; and b) vertical level-offs caused by airspace design constraints. By seeking to financially incentivise NERL to prioritise flight efficiency below 7,000ft, the CAA's approach contradicts the UK Government's direction that noise should take priority over fuel efficiency below this level.

The CAA's approach also ignores support from airlines in our consultation to exclude from 3Di scores the factors we identified as being outside of our control.

The consequences of the CAA's proposals would be as follows:

- › The CAA's proposed approach contradicts UK policy which prioritises noise over other considerations for airspace below 7,000ft.
- › Penalties in every year of RP3. Based on detailed machine learning modelling, we estimate that we will incur a penalty of around £5.4m over RP3, as our environmental performance

will exceed the CAA's proposed upper end of the deadband by 0.4, 0.7, 1.0, 1.3 and 1.6 3Di points respectively. This would reduce the regulatory return that the CAA proposes for NERL by around 3.5% and equity return by 4.9% in total over RP3, which is significant.

- › The environmental performance scheme would have no financial incentive properties. Without the prospect of avoiding penalties annually, there will be no financial incentive for us to improve the flight and fuel efficiency of airlines.
- › Our cost of capital will need to be raised to compensate us for the risk of penalties we will incur, raising prices to customers unnecessarily.
- › The 3Di performance metric will lose credibility by capturing factors outside our control and fail to reflect our true performance. This credibility is necessary to optimise the efforts of operational staff to improve airspace efficiency on a day to day basis.

To address our concerns, the CAA could :

- › Adopt a target start point for RP3 that reflects our estimate of 2019 performance
- › Maintain a flat profile of 3Di scores in RP3, which is highly challenging given traffic forecasts.
- › Support adjustments to base data to neutralise the impact of changes to the volume of airspace or accuracy of data used for 3Di (replacement radar processing system).
- › Include a change mechanism to allow the target to be modulated in the event of relevant material change (e.g. airspace modernisation).
- › Adjust the scope of the metric to exclude all the factors that we identified as being outside our control (not just non-revenue flights). An alternative approach would be to raise the 3Di target scores uniformly across RP3 to our expected performance score in 2019 and to adjust for the exclusion of non-revenue flights only 28.5 (29.1-0.6).
- › Create an additional 3Di metric for monitoring and reporting flight efficiency in UK airspace as a whole (with NERL only incentivised on those elements within its control). This would enable the CAA to observe our performance and the experience of airspace users given all the constraints that we face, thereby meeting one of the CAA's aims.

5.2. KEA (horizontal en route flight efficiency of the actual trajectories flown)

The CAA have proposed:

- › KEA will be used for monitoring purposes only
- › Targets will be based on UK reference values through engagement with the PRB³ and the European Commission
- › No financial incentives will be linked to KEA.

³ Performance Review Body, the European Commission's advisor on performance and charging issues related to Single European Sky.

The justifications offered by the CAA are that these are SES requirements.

We support the CAA's approach. KEA is less relevant metric to our customers than 3Di due to the large number of arrivals and departures in the UK's airspace compared to other countries where more flights are in level cruise across the airspace. This makes the vertical dimension of flight an important part of flight efficiency, which is captured by 3Di, and not by KEA.

Nonetheless, it will be important to ensure that the KEA target for NERL is set at a challenging but realistic level. An appropriate KEA target will ensure that NERL does not suffer from any negative reputation effects from not meeting it, which would be unfair when it is one of the strongest performing ANSPs in Europe in relation to the environment. It will also reduce the compliance burden to the CAA and NERL.

5.3. Noise

The CAA have accepted our proposals for working collaboratively with local airports and airlines; developing new data and processes; and expanding community engagement strategy.

We support this approach because the interrelationships between noise, emissions and other operational factors, such as delay and capacity, are often complex and at times fundamentally contradictory. The delivery of positive outcomes in all areas is not always possible. Further, NERL has limited control over noise because the biggest impact on communities happens at lower altitudes, where the responsibility for low level routes, noise mitigation and public consultation rests with each relevant airport.

5.4. Continuous descent operations (CDOs)

The CAA have proposed to maintain 5,500ft above the aerodrome for monitoring CDOs.

The justification offered by the CAA is that this approach is consistent with UK Arrivals Code of Practice and avoids flights being non-CDO due to the UK's different transition altitude and the structure of holding stacks for London airports.

We agree with the CAA's proposal, but it will be important for the CAA to clarify that the definition of "level flight" remains as described within the UK Arrivals Code of Practice to facilitate a historical time series of data.

6. NERL's response to Chapter 4: Capacity

CAA question:

Stakeholders are invited to submit their views on any of the issues discussed in this chapter and in particular on:

- › *our draft proposals for the targets for capacity metrics and the associated financial incentives; and*
- › *our draft proposal to introduce modulation for the C2 metric for material variation between forecast and actual traffic volumes.*

Our main areas of feedback on the draft NPP's capacity proposals are as follows:

- › Go further than the EU-wide targets require and beyond what airlines are looking for in RP3. The lack of impact analysis by the CAA of their proposals means that they could compel us to focus on complying with stricter service performance targets to the detriment of the development of our network for future years, which would not be fulfilling the interests of customers.
- › Impair the coherence and flexibility of our plan which is essential because of the highly integrated nature of our operation as well as our priority for safety.
- › To address our concerns the CAA could adopt a number of options which we set out below.

We set out our response to the CAA's questions on capacity below.

6.1. Overall

The CAA have proposed:

- › **Targets:** Similar to RP2 or with some "modest improvement".
- › **Financial incentives:** With the strength "moderately" increased, from 1% bonus and 1% penalty (£6m p.a. or 27% of the equity allowance) annually in RP2 to 1.5% bonus (£9m p.a. equivalent to 41% of the equity allowance) and 2.25% penalty (£13.5m p.a. equivalent to 61% of the equity allowance) annually in RP3.

The CAA offer the following justifications for their proposals:

- › **Targets:** While the CAA acknowledge there will be more pressure on our performance in RP3 from rising traffic and planned system and airspace changes, they justify their proposals because they expect capital expenditure to deliver programmes in RP3 that should improve capacity, particularly in Southern England.

- › **Financial incentives:** They are designed to promote high levels of service quality.

NERL's view on the CAA's justification is as follows:

- › **Targets:** There is a failure of logic in the CAA's justification because it does not take into account the relevant consideration of the extra delay necessary for safety reasons that will be caused by our operations transitioning to new technology and airspace designs in RP3. These transitions, the rationale for which was set out in our RP3 Business Plan and to customers, are essential in order to achieve important strategic aims supported by customers, the CAA, other stakeholders and ourselves. It also fails to take into account that the main airspace capacity enablers in our RP3 Business Plan are at the end of the RP3 and so will not help to reduce the impact of traffic growth on capacity until the last year of RP3. Under the draft NPP proposals, the delivery of this capacity improvement would need to be delayed until after RP3 (see section 7 below), making the CAA's proposed capacity targets even more unrealistic.
- › **Financial incentives:** The CAA have not provided sufficient reasons to explain how even higher and asymmetric incentives will promote high levels of service quality. They are also set at a level where there is no chance of getting into bonus so this is a pure penalty regime and would penalise NERL for maintaining its current performance which is very good when compared to other European ANSPs.

The consequences of the CAA's proposals would be as follows:

- › **Targets:** The seven major transitions required in RP3 to new technology and airspace designs will lead to NERL failing the proposed capacity targets every year of RP2. This would reduce the incentive to make these transitions which are essential for the strategic aims of delivering capacity and high quality service performance in future years. This is contrary to the intention of the RP3 SES Performance and Charging regulations as outlined in recital 18. This states that incentives schemes should not adversely impact investments (i.e. airspace modernisation and DSESAR). This even more stretching target for NERL beyond that required by EU targets will also have limited impact on EU capacity performance overall.
- › **Delay to capacity improvements:** The funding cuts proposed under the draft NPP will delay the capacity improvements NERL proposed in its RP3 Business Plan to the detriment of all stakeholders (which is described further in our response to Chapter 5 on costs below)
- › **Financial incentives:** NERL could incur penalties of up to 2.25% of costs each year of RP3, which is equivalent to over 60% of the CAA's proposed equity allowance. We would be penalised despite delivering a strong underlying and EU-leading service performance. Our regulatory returns would need to increase to reflect this increased and asymmetric risk that our shareholders would assume.

To address our concerns, the CAA could :

- › Set targets that are challenging but achievable. Specific proposals are offered below for each metric area.
- › Reduce the level of capacity financial incentives and making them symmetric. Specific proposals are offered below for each metric area.

6.2. C1 (or overall delay)

The CAA have proposed a target for C1 of the RP2 average level of ATFM delay of 0.23 minutes or 13.8 seconds per flight. This would be used for monitoring purposes only. It would also be subject to further engagement with the PRB and the Commission (on EU targets and their application to the UK).

The CAA justify their C1 proposal as being in line with NERL's RP3 Business Plan and agreed with airline customers during consultation.

However, there is a mistake of fact in the CAA's justification because our proposal for C1 depended upon transition allowances and operating cost assumptions within the RP3 Business Plan. We were required to publish our RP3 Business Plan by 26 October 2018 before knowing what EU regulations and targets for RP3 would be. Therefore, we presented information showing that we could not attain C1 targets without a transition allowance, which was supplemented with further supporting material during customer consultation and in our responses to questions from the CAA.

The consequence of the CAA's proposal for C1 is that we would fail to meet this target in every year of RP3, which will negatively affect the UK's reputation and our own. The proposal will lead to a compliance burden on the DfT, the CAA and ourselves of having to justify our performance to the European Commission annually, including consideration of "corrective measures".

To address our concerns, the CAA could :

- › Set a higher C1 target. This should be possible through the further engagement with the PRB and European Commission because their recently proposed targets for RP3 are less demanding than those for RP2. NERL estimates that a plausible C1 target for RP3 should be 0.39 minutes or 23.4 seconds per flight. See Appendix C for more details.

6.3. C2 (or ANSP-attributable delay)

The CAA have proposed:

- › **Targets:** At the same level as RP2 (at an average ANSP-attributable ATFM⁴ delay of 0.18 minutes or 10.8 seconds per flight).
- › **Modulations:** To targets in accordance with SES regulations to reflect variations in traffic from forecast.
- › **Deadbands:** Of $\pm 15\%$ (compared to 20% deadband for bonus and 10% deadband for penalty in RP2), which will mean that bonuses and penalties will be triggered (and maximum amounts reached) sooner.
- › **Financial incentives:** Maximum bonus of 0.5% of Determined Costs and maximum penalty of 0.75% of Determined Costs (compared to symmetric 0.25% of revenue in RP2)
- › **Transition allowance:** No transition allowances or exemption days for C2.

⁴ Air Traffic Flow Management (ATFM) delay.

The CAA offer the following justifications for their proposals:

- › **Target:** This was the agreement reached by NERL and airspace users during customer consultation, which the CAA considers reasonable because of the significant airspace modernisation programme that NERL will undertake in RP3 as well as the traffic growth that is forecast.
- › **Modulations:** These will protect NERL (and airspace users) from the impact of large and unexpected changes in traffic volumes.
- › **Deadbands:** The CAA notes that under its RP3 deadband proposals for C2, NERL will trigger (and reach maximum amounts for) bonuses and penalties sooner
- › **Financial incentives:** The CAA describes its proposed increase in incentive strength for C2 as “moderate”.
- › **Transition allowance:** The CAA have not made allowances for transitions for C2 because they do not believe that this approach would be compliant with RP3 Performance and Charging Regulations and have concerns about the ability to monitor and/or confirm whether delays relate to transition or another cause.

NERL's view on the CAA's justification is as follows:

- › **Target:** There is a mistake of fact in the CAA's justification. The agreement reached between customers and NERL on our proposal for C2 depended upon transition allowances and the operating cost assumptions in our RP3 Business Plan. We presented information in our RP3 Business Plan that showed that we could not attain C2 targets without a transition allowance, which was supplemented with further supporting material during customer consultation and in our responses to questions from the CAA. It should be noted that the scale of change in RP3 far exceeds that in RP2 as it includes both the modernisation of all major ATM systems and large scale change to the UK's busiest airspace. It is by far the most significant change programme that NERL has ever undertaken, and bigger than that of any other European ANSP.
- › **Modulations:** We support the CAA's approach of providing appropriate protection for airspace users and NERL from large and unexpected changes in traffic volumes.
- › **Deadbands:** The CAA have failed to show reasoning or evidence why a narrowing of the deadbands would lead to a better policy objective i.e. improved service levels.
- › **Financial incentives:** The CAA have failed to show reasoning or evidence why a greater and asymmetric risk for C2 would lead to better service levels for airline customers. By providing a financial incentive for C2 and setting a target which is unattainable in the absence of transition allowances, the CAA are contravening recital 18 to the SES regulations that states that incentives schemes should not adversely impact investments (i.e. airspace modernisation and DSESAR).
- › **Transition allowance:** The CAA have failed to take into account (or fully explored) the relevant consideration that the PRB and European Commission have proposed less challenging targets for RP3 than are in place for RP2 and the potential relaxation of these through interaction with the Network Operation Plan (NOP). The CAA have also ignored the relevant consideration that airlines agreed our transition allowance approach during customer consultation based on their positive experience with the ExCDS transition. In relation to the CAA's concern that they would be unable to monitor whether our

classification of delay causes is correct, we follow the established Eurocontrol process and this should provide the assurance needed.

The consequences of the CAA's proposals would be as follows:

- › **Targets:** NERL will fail to meet its C2 target in every year of RP3. This gap will be about one second in 2020, almost 10 seconds in 2021 and 2022, and over 10 seconds in 2023 and 2024 (see Appendix C). The size of the gap between the CAA's target and NERL's actual performance will be even greater with the CAA's proposed cuts to the resources in our RP3 Business Plan, which would result in plan that is no longer integrated, coherent and feasible. In our Plan, and during our consultation with customers, we explained clearly that the targets we proposed assumed that we would have funding for the resources necessary to deliver these taking into account the increases in traffic in RP2 and RP3. The CAA's proposing cuts in our planned levels of resources undermines our ability to fulfil the targets and the resulting NPP is no longer an integrated, coherent and feasible plan. The analysis we presented showed that if our plan included 50 fewer ATCOs then delay would increase by an average of 7 seconds p.a., which is additional to delay of around 10 seconds p.a. caused by the transitions.
- › **Modulations:** Airspace users and NERL will be partially protected against large and unexpected changes in traffic volumes.
- › **Deadbands:** The narrowing increases NERL's exposure to risk, which means its shareholders will require a greater regulatory return.
- › **Financial incentives:** the greater and asymmetric risk of penalties will mean that a higher regulatory return will be justified, which is not yet reflected in the CAA's assessment of NERL's WACC. However, this will raise prices to customer unnecessarily.
- › **Transition allowances:** the absence of transition allowances (or too few exemption days) will incentivise us to protect the daily service and avoid penalty, which would be by reducing the number of transitions to improve the C2 score. This would significantly slow down the investment programme, because we would be making fewer transitions and only at very quiet times of year, which would delay our ability to deliver airspace change.

To address our concerns, the CAA could:

- › Remove the C2 metric from the performance regime: if the CAA's reaches the view that transition allowances and/or exemption days may not be compatible with RP3 EU regulations, or that the target cannot be raised as suggested above, then the CAA should consider removing the C2 metric from the performance regime. C2 has significant overlap with C1 and has the same cause codes as C3 and C4. Airline feedback is that C3 and C4 are more important delay measures for them. This is our preferred option; or by
- › Remove the financial incentive from C2 altogether or at least reverting to RP2 symmetric levels; or by
- › Increase the C2 target to the maximum amount allowed by the EU-wide targets and/or interaction with the NOP. Our analysis in Appendix C suggests that another average 10 seconds per flight per annum is required (or a target of an average 20 seconds per flight per annum or 0.33 minutes).

If the CAA proposes to reduce allowances for operating costs proposed in our RP3 Business Plan by around £71m across RP3, then the C2 target would need to be raised further.

6.4. C3 (or the time and duration of delay)

The CAA have proposed:

- › **Target:** With an impact score of 19 (compared to 20 for RP2).
- › **Deadbands:** There would be a lower and upper bounds of 14 and 22 respectively (compared to 16 and 24 for RP2).
- › **Financial incentives:** Increasing the incentives on C3 while also making it symmetric with 1% or around £6m p.a. for bonus and penalty, which is around 27% of the proposed annual equity return allowance (compared to 0.75% bonus and 0.5% penalty in RP2).
- › **Exemption days:** 75 days over RP3 on which any delay incurred will not count towards the target (with 21 days allowed consecutively for each transition).

The CAA offer the following justifications for their proposals:

- › **Target:** The changes to the target are "modest".
- › **Deadbands:** The approach is consistent with RP2.
- › **Financial incentives:** The increase in incentive strength reflects feedback from airlines on the relative importance of this measure of delay to them.
- › **Exemption days:** This approach is the same as adopted in RP2.

NERL's view on the CAA's justification is as follows:

- › **Target:** The CAA have failed to show sufficient reasoning or evidence why this tightening of the target is required or in customer interests given its effects, in the context of traffic growth and significant transitions to new technology and airspace in RP3. Airlines

supported maintaining RP3 targets at the same level as in RP2⁵ and the CAA have not demonstrated why it would further the interests of customers to override their agreement.

- › **Deadbands:** NERL supports adopting the same deadband approach in RP3 as RP2 (which matches our RP3 Business Plan).
- › **Financial incentives:** The CAA have failed to take into account the relevant consideration that airlines supported NERL's RP3 Business Plan proposal that the financial incentives for RP3 should match those in RP2, noting that these already place a greater weight on C3 than on other capacity metrics.
- › **Exemption days:** The CAA have failed to take into account that we are proposing to put in place significant new changes in technology and airspace in RP3. There will be 7 major transitions in RP3 compared to 2 in RP2. This means that a greater number of exemption days are required in RP3 than RP2 if this approach is adopted to accommodate transitions (instead of transition allowances). See Appendix C for more details. The main capacity gains from airspace changes will not be delivered until the last year of RP3 so provide little or no mitigation against these targets.

The consequences of the CAA's proposals would be as follows:

- › **Target:** NERL would fail its C3 target each year of RP3. This would be made worse by the CAA's proposed reductions in allowances for operating costs compared to RP3 Business Plan. This is because staffing delay can trigger C3 delay at high traffic levels. In 2016, NERL had almost 159,000 or 4 seconds delay per flight due to staffing.
- › **Financial incentives:** A higher regulatory return will be required. This could raise prices to customers unnecessarily.
- › **Exemption days:** NERL would be incentivised to reduce the number of transitions to protect current service performance, which would significantly slow down the investment programme, including the delivery of airspace change.

To address our concerns, the CAA could:

- › Increase the target from 19 to 20 (in line with the RP2 target, for which NERL failed to earn a bonus in RP2, because it is an ambitious target).
- › Maintain these at RP2 levels.
- › Increase exemption days from 75 to 150 days.

6.5. C4 (or significant delay)

The CAA have proposed:

- › **Target:** With a score of 1,800 (compared to 2,000 for RP2)

⁵ CAA 2018, RP3 Customer Consultation Working Group: Report of the Co-Chairs, para 4.2-4.3, pp. 19

- › **Financial incentives:** Increasing to 0.5% or around £3m p.a. of Determined Costs, which is equivalent to 14% of the proposed annual equity return allowance (compared to 0.25% or turnover in RP2)
- › **Exemption days:** 75 days over RP3 where delay will not count towards the targets, with 21 days allowed consecutively.

The CAA offer the following justifications for their proposals:

- › **Target:** Follow-up action by NERL to the Independent Enquiry regarding resilience should improve our C4 performance.
- › **Financial incentives:** This “modest” increase reflects feedback from airspace users that they value this metric compared to others.
- › **Exemption days:** in line with RP2.

NERL's view on the CAA's justification is as follows:

- › **Target:** The CAA have failed to show sufficient reasoning or evidence why this tightening of the target is required or in customer interests given its effects, in the context of traffic growth and significant transitions to new technology and airspace in RP3 (and airline support for keeping the RP3 target at RP2 levels).
- › **Financial incentives:** The CAA have failed to take into account the relevant consideration that airlines supported our approach in the RP3 Business Plan, which proposes that these are maintained at RP2 levels⁶.
- › **Exemption days:** The CAA have failed to take into account that NERL is proposing to implement significant new technology and airspace changes requiring 7 transitions in RP3 compared to 2 in RP2. This means that a far greater number of exemption days are required in RP3 than RP2. See Appendix C for more details.

The consequences of the CAA's proposals would be as follows:

- › **Target:** NERL could fail its C4 target each year of RP3. This would be made worse by the CAA's proposed reductions in allowances for operating costs compared to RP3 Business Plan. This is because staffing delay can trigger C4 delay at high traffic levels. In 2016, NERL had almost 159,000 or 4 seconds delay per flight due to staffing.
- › **Financial incentives:** A higher regulatory return will be justified for the associated risk. This could raise prices to customers unnecessarily.
- › **Exemption days:** NERL would be incentivised to reduce the number of transitions to protect current service performance, which would significantly slow down the investment programme, including the delivery of airspace change.

⁶ See above

To address our concerns, the CAA could :

- › Increase the target from 1800 to 2000.
- › Maintain C4 financial incentives at RP2 levels.
- › Increase exemption days from 75 to 150 days.

7. NERL's response to Chapter 5: NERL RP3 costs

CAA question:

We would welcome views on any aspect of the issues raised in this chapter, and in particular on:

- › *our assumptions for operating costs, non-regulatory revenues and capital expenditure to support the calibration of NERL's price control and the Determined Costs in the UK performance plan;*
- › *whether we should consider issuing a Regulatory Policy Statement in respect of our pensions policy; and*
- › *how best to improve the governance and incentive arrangements relating to NERL's capital expenditure and whether NERL should have a new licence obligation to support and drive forward airspace modernisation.*

Our main areas of feedback on the draft NPP's proposals for NERL's costs are as follows:

- › NERL needs to have the resources and funding to meet customer priorities by providing a safe, high quality and resilient day-to-day service and delivering our technology programme and airspace modernisation, as well as to respond to the uncertainties in RP3:
 - › Operating costs: The CAA's proposed £71m reduction is not well evidenced or logical, and removes the coherence and integrity of our plan. It would cause us to delay the technology programme and therefore airspace modernisation, and preparations for Heathrow airport's runway 3. This is because we would need to focus resource on delivering the day-to-day service to avoid near term Licence breach rather than delivering the long term strategic outcomes required by the Transport Act 2000 to further the interests of operators and owners of aircraft, owners and managers of aerodromes and the travelling public. As a result, service performance in future reference periods would deteriorate, and we will face higher technical resilience risks for ageing equipment. Additionally, the CAA's proposed cost reductions could lead to a deterioration in employee relations, at time where having an engaged workforce is critical to deliver a high quality service with ever increasing traffic, and the most complex change programme in our history. Essentially the proposed cost reductions would compel NERL to make an irrational choice between

- short time licence breach and long term licence breach through lack of resources to prepare responsibly for the future.
- › Non-regulatory income: There are valid reasons why non-regulatory income into the single till will reduce in RP3. The CAA's proposed £49m increase to non-regulatory income is not plausible – this represents a 140% increase on non-regulatory income from infrastructure and site sharing, excluding FMARS. This proposed increase in single till income therefore effectively represents a further reduction to our Determined Costs. To achieve this, we would need to reduce our operational ATCO headcount over and above what would be required by the CAA's proposed operating costs reductions, and would not be able to implement any transitions for the technology and airspace programmes. This would create serious long term implications for us and for UK aviation.
 - › Pensions: Historically, the CAA have systemically taken an overly optimistic view of market conditions, and continue to do so in relation to RP3. Funding for our projected deficit repair contributions is required. Also, this is an equitable way to fund the pension scheme between airspace users in RP3, and those in future reference periods. Separately, we are strongly supportive of the provision of a regulatory policy statement as we can see the potential for customer value being realised.
 - › Capital expenditure: The CAA's proposed £49m reduction in capital expenditure would lead to later delivery of customer benefits, and would mean incurring stranded costs and/or restructuring costs. These costs are not reflected in the NPP. This is not a productive use of resources or an efficient use of our customers' money.
- › NERL's cost efficiency proposal (2.3% p.a. real terms reduction to NERL's determined unit cost in RP3) was already stretching and exceeded the EU-wide target of 1.9% reduction p.a. In RP3, we plan to provide a safe, high quality, resilient service 24/7, with higher traffic. At the same time, we will be modernising the UK's airspace with multiple deployments enabled through the completion of the largest and most complex technology programme that we, or any of our European counterparts, have ever undertaken. Given that prices are reducing, this is already demonstrably delivering 'more with less' in RP3.
 - › By proposing a 26% real reduction in average prices between RP2 and RP3, the CAA have attached far greater importance to cost reduction than to capacity. This is diametrically opposite to the repeated demands across Europe from a wide range of stakeholders for increased capacity, and improved service quality, predictability and resilience – most notably from the European Commission. The UK's unit rate ranked 10th in 2019 - the lowest of the 'big 5' States,

compared to 2014 when it was 2nd highest. The severity of the CAA's proposed cost reductions to our RP3 Business Plan is disproportionate and will lead to significantly adverse outcomes for the travelling public in the long term.

Our views on the CAA's assumptions for operating costs, non-regulatory revenues and capital expenditure

We set out below our response to the CAA's request for views on its assumptions for operating costs, non-regulatory revenues and capital expenditure to support the calibration of NERL's price control and the Determined Costs in the UK performance plan.

7.1. Operating costs, excluding depreciation and pension costs

The CAA have proposed:

- › **Resource increases between 2017-2019:** The CAA have accepted NERL's projections of required resource increases between 2017-2019.
- › **Starting point for cost reductions:** The CAA have assumed that NERL can start to achieve more significant cost efficiency gains from 2019, rather than 2020.
- › **Operating costs reduction:** The CAA have proposed a cumulative reduction of £71m (2017 prices) to NERL's proposed operating costs (excluding depreciation and pension costs) from 2019. This represents a reduction of 2.3% per chargeable service unit (CSU) p.a. from 2019.

The CAA offer the following justifications for their proposals:

- › **Resource increases between 2017-2019:** The CAA acknowledge that NERL needs "to deal with quality of services issues, make further progress with technology change and push forward work on airspace modernisation".
- › **Starting point for cost reductions:** The CAA does not offer any justification or explanation for their decision to apply cost efficiency targets from 2019, rather than 2020.
- › **Operating costs reduction:** The CAA appear to justify their proposal (2.3% p.a. from 2019) on the basis that it is close to NERL's proposal in the RP3 Business Plan (2.2% p.a. from 2020), and is in the range of Steer/Helios' high and low cost reduction, which imply cumulative reductions in operating costs between £57m to £133m over RP3. The CAA have stated their proposal is consistent with historical operating costs per CSU reductions from 2007 to 2017 (2.3% p.a.) and average operating cost outperformance from 2007 to 2017 (4.9%). The CAA also draw on PRB advice to the European Commission, which estimated the potential for operating and capital cost efficiencies from based on the average cost efficiencies for 2014 – 2016 baseline was around 8%.

NERL's view on the CAA's justification is as follows:

- › **Resource increases between 2017-2019:** We support the CAA's decision to accept the cost of these resource increases. These are required to increase our operational manpower to catch up with traffic growth in RP2, train new ATCOs, deliver our technology programme, progress airspace modernisation, enhance our future ATM capability, manage the impact of drones, and increase cyber-security. The associated resources are now either in place or recruitment in is progress.

- › **Starting point for cost reductions:** The CAA does not offer any justification or explanation for their decision to apply cost efficiency targets from 2019, rather than 2020. Also, there is a lack of logic in this proposal given that the CAA accept the need for cost increases between 2017 – 2019. It is counter intuitive that total operating costs (excluding pensions) in 2020 would be lower than in 2019. To give an example, part of the cost increase between 2017 and 2019 is driven by the cost of training new ATCOs. When they qualify they will be deployed in our operation at higher salaries reflecting their operational qualifications. It would not be rational to remove those trained resources in 2020 and beyond.
- › **Operating cost reduction:**

Taking each of the justifications for cost reductions in the NPP in turn:

- › The CAA's decision to select 2019 as the starting point, rather than 2020, is the main reason for the £71m operating cost reduction, compared to our RP3 Business Plan. This is a material difference, with substantial implications if implemented.
- › Although the CAA cost reduction proposal is within the range proposed by Steer/Helios, there are serious flaws in the way that this range has been calculated. Steer's analysis uses a simplistic theoretical approach which seeks to assess resource and cost requirements mainly based on changes in traffic. While this relationship is a relevant reference point, account also needs to be taken of the level of resources needed to provide a safe and high quality 24/7 service with higher traffic projected in RP3 and the need to provide significant resources for the technology and airspace programmes together with Heathrow airport's runway 3. There are also additional requirements for the fast evolving cyber threats and to provide a safe operating environment for drones.

Neither the CAA nor Steer have offered any impact assessment, trade-off rationale or evidence to justify why the proposed savings would not affect NERL's safety and service performance, operational and technical resilience, or our ability to deliver our technology and airspace modernisation programmes.

The Steer study did not propose a reduction to NERL's non-staff operating costs. Therefore, it is not logical to justify the reduction in all operating costs (staff and non-staff) through reference to the Steer study.

We engaged NERA to review Steer's methodology to estimate headcount. NERA's findings are provided in Appendix E. In particular, NERA found a number of flaws with Steer's approach, including:

- Limited ability to explain relationships (low explanatory power): Steer's model only explains 10% and 20% of the changes in operating costs and ATCOs in Ops respectively over time. Therefore, the model is not sufficiently robust to forecast headcount or costs with sufficient accuracy to base decisions on.
- Omitted variable bias: As the low explanatory power of Steer's 'efficient operator model' shows, its approach does not take account of important factors which drive NERL's headcount requirement (e.g. complexity). Where these factors are correlated with traffic growth in the data sample, their exclusion from the model will likely lead to an understatement of the responsiveness of headcount to traffic. For example, ATCO headcount is likely to respond to forecast growth (due to the lead times required to recruit and train ATCOs) as well as actual growth in traffic, and to the changes in the productivity of ATCOs.

- Double counting productivity improvements: As a result of omitting important variables from the model and adjusting separately for the impact of DSESAR in the model, Steer double counts the benefits of productivity improvement. Steer's analysis uses historical headcount data for European ANSPs which reflects the productivity benefits from various investment programmes. Therefore, by including an additional adjustment for DSESAR, Steer's ATCO headcount is understated since it counts the impact of technological progress and change twice: once in the a lower estimate of traffic elasticity and again separately based on its own assessment of the impact of DSESAR for NERL over RP3. Steer should make a smaller adjustment to headcount for DSESAR; its estimate should reflect only the incremental benefit of DSESAR relative to the historical trend in technological progress achieved by European ANSPs.
- Flawed choice of base year: Steer's approach of selecting 2017 as the base year for its analysis is not justified. 2017 was not a representative year because there were no material technology or airspace transitions (unlike RP3 when 7 major transitions are planned). Also, the selection of this base year, in which our performance was better than target, does not take variability in our annual service performance into account. In some neighbouring years with similar headcount, performance was worse than target. Therefore, Steer's approach underestimates the extent of resources required for 'catch-up' and resilience, to handle increased traffic and deliver the high quality service customers require.
- Material limitations in model philosophy: Steer's simple model makes a series of unrealistic assumptions that lead to unreliable conclusions. NERA highlight a number of limitations to the model, including: an assumption that the relationship between traffic and headcount is linear, when in reality it is likely to be stepped; an inability to reflect the replacement of experienced ATCOs with multiple validations with new ATCOs with less experience; the use of changes in independent variables rather than absolute values, leading to a failure to account for the starting levels of each ANSP; an inability to reflect training lead times; and failure to remove fixed effects in the model.
- Flawed choice of comparators for MSG/PCG staff: Due to a lack of information about Steer's approach, NERA were unable to econometrically appraise Steer's method for calculating the elasticity of MSG/PCG staff. However NERA note that even if Steer's method was sensible in principle, it would not be valid to compare elasticity from airports and ANSPs because this would require certain assumptions to hold, such as identical trade-offs between capital and labour. Given capacity constraints at airports and the differing proportions of fixed assets and labour used in delivering airport services this is unlikely. Therefore, Steer's model is likely to underestimate the number of MSG/PCG staff required.

These difficulties with Steer's methodology and approach go far beyond the normal uncertainties that might be attached to any modelling of this kind. Given the extent and scale of the flaws in Steer's analysis, it would not be appropriate for the CAA to rely on this study in the RP3 determination.

NERA have developed improved alternative econometric models which are better able to explain the variation in headcount than Steer's models. However, by NERA's own admission, there are a number of limitations to these models. Therefore, NERA recognise that "NERL's management expertise provide more accurate estimates of headcount", for example, because this enables NERL to take account of the

interdependencies between factors driving headcount and the complexities of the business.

- > Our focus in RP3 will be on creating capacity (through our technology and airspace programmes) to handle ever higher traffic levels in the future, while at the same time delivering a safe, high quality, resilient 24/7 service. This is in contrast to the environment in previous reference periods where the focus was on cost reduction. Further, there are new requirements in RP3 that did not exist in previous reference periods (see below). We expect further gains in efficiency in RP4 through the process described above when we have completed DSESAR and delivered airspace modernisation.
- > Key reasons for our headcount projections are as follows:
 - Our ATCO population will increase throughout RP3 to enable us to keep pace with traffic growth, to enable us to prepare for Heathrow airport's runway 3, and to increase our resilience in line with recommendations from Project Oberon. Our ATCOs will also provide critical support to our technology programme, e.g. testing, validating and training. With expected continued traffic growth in RP4 (estimated at over 3 million flights by 2030), further operating cost efficiencies will be possible on top of those delivered in RP3 as we handle even higher traffic without proportionate increases in operational resources.
 - Technical Services resources will increase initially in RP3 to support the dual running of the existing and new systems, to manage the increased scope of Technical Services (including evolving cyber-threats, the maintenance of new systems which do not have a legacy equivalent such as ExCDS, and more complex controller tools), and to enhance our future ATM capability in light of reduced income from EU funding for SESAR following Brexit⁷. We must also ensure that we have sufficient resources to deliver technical resilience in line with the resilience requirements agreed as a result of the independent enquiry.

By the end of RP3 we will have completed our transition to a new and flexible system architecture and completed our transition to an agile service operations management approach to operating our systems. These new approaches will have enabled a significant reduction in Technical Services staff (22% reduction by the end of RP3 compared to 2018) and are designed to serve us for the long term such that we can continue to manage growing traffic and make further systems enhancements more easily and cost effectively while delivering continuous operating cost efficiencies.

- > NERL has committed to continuing efficiency gains throughout RP3, and included around £70m of unsecured efficiencies in our RP3 Business Plan at our own risk. However, it is not credible to assume that NERL can continue to achieve efficiency gains consistent with historical performance from 2007 to 2017. In our RP3 Business Plan we provided evidence that the evolution of our cost base was consistent with the performance of other UK regulated companies in the years following the introduction of price control regulation. This showed that large reductions could be made in the years

⁷ In the event of NERL's claims for expenditure in support of the SESAR Deployment Manager being disallowed/cancelled following Brexit, we propose to offset these costs against INEA project funds that have been received and to be returned to airspace users in future periods. This is in line with the position agreed with the CAA and highlighted in the 2018 user consultation.

immediately following privatisation but that subsequently only more gradual reductions could be made without impacting service delivery.

- › The PRB estimate for potential operating and capital cost efficiencies is not sufficiently robust and should not be relied upon. This estimate is based on the academic study commissioned by the PRB. The report itself notes that issues with the data lead to 'substantial uncertainty' and that the exercise 'deviates from more established regulatory benchmarking'⁸.
- › In addition, the NPP fails to take into account the following pieces of evidence:
 - › NERL's favourable performance within its European comparator group: According to ACE 2016 data (the most recent report), we continue to benchmark favourably within the other 'Big 5' ANSPs, coming out at the top of the comparator group for three cost efficiency metrics (including economic cost effectiveness), in second place for two cost efficiency metrics, and in third place for one cost efficiency metric. In addition, we have the 5th highest ATCO productivity from 28 ANSPs across Europe, even with some of the most complex airspace. Also, we outperform the European-wide average for all metrics bar one. Finally, we are committed to a larger, more comprehensive change programme than any other state. For these reasons, it is not logical that the UK should be set a cost efficiency target which is significantly more challenging than the proposed EU-wide target.
 - › Lack of any impact analysis arising from proposed reductions in opex: The NPP does not provide any analysis of the impact of its proposals on other performance outcomes. Given the integrated nature of our plan, it is unreasonable to expect cost reductions to have no impact on the outcomes, or to assume that there is no cost associated with their achievement.

The CAA have failed to ring fence all costs related to airspace modernisation which is their stated intention: By applying an across the board cut to all operating expenditure, the CAA have inadvertently also reduced funding for resources that it intended to ring fence for airspace modernisation. The total funding requirement equates to around £23m (in 2017 prices) of operating cost across RP3 which, following the CAA's ring fencing approach, should not be subject to any cost efficiency measure. Further, the NPP has not included in Determined Costs any allowance for the operation of the Airspace Change Organising Group (ACOG). We estimate this will require at least £15m (2017 prices) of funding in RP3 and, following guidance from the CAA, we included these costs within our wider RP3 Business Plan (rather than core plan). Now that this work has been commissioned jointly by the DfT and the CAA in 2018, these costs need to form part of the Determined Costs. Appendix D includes an analysis of the minimum ACOG costs required, and an estimate of potential additional costs and how these could be funded. Furthermore, the assumption that airspace modernisation costs can be ringfenced from other operating costs is fundamentally flawed. Airspace modernisation is dependent on completing the technology upgrade which in turn relies on the technical and operational resources to design, assure and train as well as safely transition into service.

⁸ EU-wide target ranges for RP3, Annex 2. Air Navigation Service Providers: Advice on benchmarking of ANSPs and EU-wide cost targets, 03 June 2018

- › The NPP is also inconsistent in its approach because it proposed reductions in planned costs, without taking into account the restructuring costs which will be necessary for NERL to meet the proposed opex allowance of the NPP. As highlighted by Steer in their report, NERL would incur restructuring costs to meet the proposed opex allowance. Restructuring would be necessary as NERL cannot achieve the CAA's proposed targets through natural attrition while at the same time reskilling its existing staff base for new technology. To meet the proposed opex allowance, the NPP would need to account of around £6m - £10m of restructuring costs depending on the timing. To be clear, we are simply pointing out that the CAA's proposals are incomplete and are not requesting such restructuring costs unless the CAA does not change its proposal in the NPP.
- › The calculation of the CAA's stated cost efficiency assumption (2.3% p.a. from 2019) omits expenditure projected for the ACOG which the CAA intends to ring-fence (see comment above). Any update to this assumption should include ring fenced ACOG costs and should use the final selected traffic forecast.

The consequences of the CAA proposals would be as follows:

- › Given Steer's finding that the non-staff operating costs and pay assumptions of NERL's RP3 Business Plan are materially efficient, this suggests that the CAA must believe that NERL can achieve the lower NPP operating costs through headcount savings. This would mean 160 fewer people p.a. on average in RP3, with the stepped profile of the CAA's cuts implying around 60 fewer people in 2020 and increasing to around 255 by 2024 (7% of projected headcount in 2024).

If we had to allocate the CAA's proposed cuts to our RP3 Business Plan proportionately to the budgets that different business areas manage, then cuts would be required in the following areas: £31m in operations; £20m in technical services; and £20m in other business areas (safety, facilities management, information solutions, finance, insurance, regulatory costs, human resources, supply chain, communications, legal and future ATM capability).

Starting with other business areas, it is not credible to achieve reductions of this size for the following reasons. First, the business areas that were reviewed by consultants were found to be efficient. Second, these areas have already been the focus of sustained efficiency drives since PPP and the scope for further reduction is very limited without impairing the capability of these functions in important respects. For example:

- › Safety team: Reductions would impair delivery of our quality and safety plans.
- › Communications team: Reductions would weaken our ability to engage with communities to support airspace modernisation which will affect approaching 30 million people.
- › Information solutions team: Reductions would result in reduced analytical support to our investment programmes, impacting programme efficiencies and our ability to project, optimise and report benefits.

Given the scale of these reductions to our plan proposed by the CAA, and taking into account the relatively small contribution to these from other business areas, it is likely that the majority of the cuts would need to be made to resources in operations and technical services. While we would make every effort to protect the quality of the daily service in RP3, we would need to reduce the number of new controllers entering the operation which, given

the expected number of ATCO retirements in RP3, would lead to significant service performance degradation in RP4 and beyond.

In addition, the planned build-up of operational resources to meet the increased demand from Heathrow airport's runway 3 would have to be delayed. Given the training lead times for new ATCOs, and the fixed training capacity on Heathrow airport's approach sectors, if we are unable to commit to any additional resource in RP3, it is likely to be late RP4, at the earliest, before the required number of additional staff could be in place.

There would also be a loss in resilience and capability to address known capacity bottle necks or hotspots, and later delivery of the future ATM capability. There would be fewer resources available to support capacity management and network improvement initiatives.

Our investment plan deployments require significant operational controller input to support validation, training and transition. This means that we are reliant on additional controller numbers above those required to deliver the core service. As a result, the proposed reductions in resources in operations and technical services would disproportionately impact transitions, and delivery dates for the DSESAR platform and for airspaces changes required for LAMP, and Heathrow airport's runway 3.

Table 1: Impact of NPP on key dimensions of our RP3 Business Plan

Key dimensions	NERL's plan	What we would have to do if NPP stands
Service	Maintain RP2 target levels	Meet EU-wide targets
Milestones	21 (14 airspace + 7 DSESAR)	10 – 15
Major milestone delivery	Biannual (spring/autumn)	Annual
Transition programmes	Run in parallel	Run in series
Programme length	5 years	6 – 8 years
DSESAR platform completed	2023	2024 at earliest
Airspace modernisation	2024 -2026	2025 -2028
Heathrow runway 3	Airspace changes to R3 schedule	2028 onwards
Price (average in RP)	14% reduction on RP2	26% reduction on RP2

- › As a result, it is likely that the airspace and technology programmes would be delayed by between 1 and 3 years and we would not be able to deliver more capacity and improve resilience for our customers. The delay to the technology programme would require extended use of our existing systems, leading to increased sustainment and operating costs to cover a longer period of dual running. We would also be operating at an unacceptably higher risk of technical failure, until these changes were complete, as well as running potentially obsolete, unsupportable technology.

In addition, such reductions could also lead to deterioration in currently good employee relations, in a reference period where having an engaged workforce is critical to deliver the service and change programme.

To address our concerns, the CAA could:

- › Provide us with the funding for the resources required to deliver the most challenging and complex set of programmes in our history, by allowing operating costs at the level proposed in our RP3 Business Plan. This would also enable the CAA to hold us to account for delivering the outcomes in the NPP within the RP3 timescales in a way that reducing the resources would not allow.
- › Avoid the need for up to £10m of restructuring costs which would be inefficient and an illogical use of user charges – customers would be paying for a reduction in the flexibility needed to respond to their requirements.

If the operating cost proposals in the NPP are unchanged, the CAA should recognise that this would cause us to delay the technology programme and therefore airspace modernisation, and preparations for the third runway at Heathrow airport, creating serious consequences for service performance in future reference periods. The CAA should also include allowances for up to £10m restructuring costs to enable us to meet the proposed reduction in operating costs.

7.2. Non-regulatory revenues and costs

The CAA have proposed:

- › An overall increase in non-regulatory revenue of £35m compared to our RP3 Business Plan, comprising:
 - › An increase to the contribution of non-regulatory income in the single till of £49m over RP3 (about £10m per year). The CAA note that they have modelled this as a revenue increase, but that their proposal reflects the potential both for cost savings and revenue increases.
 - › A reduction in the non-regulatory income derived through the FMARS contract of £13m over RP3. However, the CAA have not reflected their inflation assumptions in the FMARS income, and, due to a technical issue, have not fully reflected the impact of their proposed cost reductions on the FMARS price. This means that the NPP's projection of income from the FMARS contract is overstated.

The CAA offer the following justifications for their proposals:

- › There is “uncertainty about the robustness of NERL’s revenue and cost forecasts”, and that we did not provide detailed information to fully explain whether the reduction in our non-regulatory revenue was consistent with our forecasts of operating costs.
- › The NPP’s proposals appear to be based on the rationale that CEPA⁹ concluded our approach to forecasting FMARS and North Sea Helicopters appeared reasonable, and did not identify any material irregularities or omissions in our approach to forecasting inter-

⁹ The CAA commissioned CEPA to review NERL’s approach to cost allocation and to assess the reasonableness of NERL’s non-regulatory revenue.

company revenues. CEPA also found there “may be scope for more ambition to generate ‘other’ non-regulatory revenues, if, for example, more resource is found to support other revenue sources or if NERL is able to make additional use of joint ventures to expand the resources available”.

NERL’s view on the CAA’s justification is as follows:

- › The table below provides a breakdown of all the sources of non-regulatory income, and shows that where non-regulatory income has reduced, the corresponding costs were also reduced in our RP3 Business Plan. In the last column, we explain why it is not feasible to increase the contribution to non-regulatory income, and confirm, where possible, the related costs in our RP3 Business Plan are consistent. Note that percentages do not add to 100% due to roundings.

Table 2: Feasibility to increase contribution of each source of non-regulatory income in RP3

Source of 'non regulatory income'	Contribution to non-regulatory income in RP3	Feasibility to increase contribution in RP3
FMARS contract	46%	<p>FMARS revenue projections reflect the value of the extended contract which is being negotiated with MoD. The work undertaken by NERL over the last three years to extend of this contract will secure a fair contribution from the MOD towards the cost of NERL’s infrastructure, including DSESAR investments until 2030.</p> <p>NERL’s efforts to secure this income will mean that prices paid by airlines continue to be lower (by around 7%). We will continue to work hard to retain this income stream.</p> <p>Both CAA and CEPA have reviewed these revenue projections, along with the related costs which have reduced. CEPA noted that ‘NERL’s approach to forecasting income from the FMARS contract appears reasonable.</p> <p>It is not feasible to increase the contribution of FMARS to the single till because its value represents a fair contribution by the MoD towards our infrastructure costs.</p>
London Approach	14%	<p>The London Approach income and costs have been reviewed by CEPA, and the CAA will set the charges via the RP3 price control.</p> <p>CEPA confirmed that NERL’s London Approach income forecast was aligned with the forecast costs.</p> <p>It is not feasible to increase the contribution of London Approach to the single till because its value is based on the costs of the service.</p>

Source of 'non regulatory income'	Contribution to non-regulatory income in RP3	Feasibility to increase contribution in RP3
North Sea Helicopters	9%	<p>CEPA have reviewed the North Sea Helicopters income and costs, concluding that 'NERL's approach remains a reasonable method for forecasting income from the North Sea Helicopters service'.</p> <p>It is not feasible to increase the contribution of North Sea Helicopters to the single till because its value is based on the costs of the service.</p>
Income from NSL	11%	<p>Income from NSL will reduce in RP3 because we will redeploy NERL resources on delivering the outcomes presented in our RP3 Business Plan (e.g. the training college will train NERL ATCOs, rather than supporting NSL's third party business). There is a corresponding reduction in cost. We have provided detailed information on income from NSL and associated costs to the CAA.</p> <p>In addition, our projections for income from NSL in our RP3 Business Plan included Biggin Hill airport. Therefore, there will be a shortfall against our projections as a result of the CAA's proposal to move Biggin Hill airport within the scope of London Approach. The CAA should factor this loss of non-regulatory income into their proposals.</p> <p>CEPA did not find any material irregularities or omissions in NERL's approach to forecasting inter-company revenue.</p> <p>We do not currently see opportunities to expand this income but, in any case, it is not feasible to increase non-regulatory income without an allowance for the associated costs.</p>
Other revenue		This is composed of a number of sources of income.
Other revenue (SESAR Deployment Manager)	1%	<p>In RP2, we were reimbursed for costs incurred relating to the SESAR Deployment Manager (mainly procurement costs). Since January 2018, the SESAR Deployment Manager has been formed as a legal entity and has incurred its own procurement costs. Therefore, there has been a reduction in costs incurred by NERL and there has been a corresponding reduction in revenue. We have provided detailed information on income from the SESAR Deployment Manager and associated costs to the CAA.</p> <p>It is not feasible to increase the contribution from the SESAR Deployment Manager to the single till.</p>
Other revenue (SESAR 2020)	<1%	<p>This is not within NERL's control.</p> <p>Following Brexit, it is unlikely that we will continue to</p>

Source of 'non regulatory income'	Contribution to non-regulatory income in RP3	Feasibility to increase contribution in RP3
		<p>receive European funding for the SESAR 2020 R&D programme. If we do receive R&D grant income (either from SESAR 2020 or from the UK), then we will pass these funds to customers in line with the charging regulation.</p> <p>However, we will still need to undertake R&D to support development of our future ATM capability to ensure that we can keep pace with technological development, to de-risk our investment plans, deliver future benefits to customers and maintain interoperability with other European ANSPs. Therefore, there is no reduction in costs.</p>
Other revenue (Infrastructure sharing / site sharing)	3%	<p>We already share our infrastructure and sites through our contract with the MoD and contracts with other customers for radio masts.</p> <p>It would be very challenging to increase revenue in RP3 as there are no obvious new customers to share infrastructure/sites with. Our prices for sharing radio masts are likely to decrease in RP3 because this is an increasingly competitive market.</p> <p>We also expect Brexit will further diminish site sharing opportunities – in RP2 revenue from site sharing has reduced as a direct result of Brexit (e.g. relocation of the Galileo space contingency facility from our Swanwick Centre to Madrid).</p>
Other revenue (Managed Service Agreements)	13%	<p>Costs allocated from NERL to NSL will remain stable during RP3, and are reimbursed at no margin. This has been reviewed by CEPA, who 'did not find NERL's approach to forecasting MSA revenue to be unreasonable'.</p> <p>It is not feasible to increase the contribution from the Managed Service Agreements to the single till.</p>
Other revenue	4%	<p>We project a modest fall in income and associated costs as we will redeploy NERL resources on delivering the outcomes presented in our RP3 Business Plan. There is a corresponding reduction in cost.</p> <p>We have provided detailed information on 'other revenue' income and associated costs to the CAA.</p>
	100%	

- › The CAA's proposal is not rational. The table shows it would not be feasible to increase non-regulatory income in RP3 beyond the levels set out in our RP3 Business Plan.
- › It is relevant to this proposal that the PPP structure deliberately separated the higher risk, market competitive commercial activity undertaken by the NATS group and ring fenced it in the NSL legal entity. In contrast NERL was entrusted with lower risk activity based on monopoly services. NERL was intended to capitalise on additional sources of income through infrastructure sharing. The proposed level of non-regulatory income would fundamentally change the level of ambition and risk that NERL would need to take and require it to establish a suitably skilled commercial function to achieve those objectives. Customers would bear the associated costs and risks of thin margin business. This is in direct contrast to the PPP structure as reinforced by relatively recent risk and ringfencing work carried out by the CAA, designed to minimise the exposure of customer pricing to commercial risk intrinsic to NSL's activities.
- › The greatest contribution to the single till income is earned from the low risk sharing of infrastructure where the market is limited and where the MoD is the only obvious customer.
- › In the absence of potential for more infrastructure sharing, even a moderate increase in non-regulatory income would require an allowance for additional costs. This point is made in CEPA's report, which stated that 'additional non-regulated activities would only make a modest contribution (for example, an additional 10% of 'other' income would equate to ~0.6M per annum) via the single till'. CEPA stated this would be possible if 'for example, more resource is found to support other revenue sources'. However, the CAA's proposal does not take account of the need for additional costs.
- › Increasing the contribution from non-regulatory income by £10m p.a. would require revenues to be generated of low hundreds of millions pounds which is clearly unachievable. Given the lead time to generate this income, the current start point would imply much higher revenues at the end of RP3 than at the beginning. This further demonstrates the lack of realism in the proposals.
- › Neither the CAA nor CEPA have indicated why an increase of this scale is feasible and suggested how this might be achieved. This is in contrast to previous reports commissioned by the CAA in relation to Heathrow Airport Ltd price controls, in which the CAA's consultants provided and justified their own projections for each element of commercial income.
- › In addition, we have identified a technical issue in the way the CAA have modelled the impact of their proposed reductions in our planned operating costs on the FMARS contract price. As a result, the FMARS contribution to non-regulatory income is overstated by £1m. Further, because the CAA have not adjusted the FMARS income to reflect their inflation assumptions on the RPI-CPI wedge, the NPP overstates the value of the FMARS contract by £400k. Note that, at the time of our consultation response, we have not yet received final approval from the MoD on the FMARS contract in from 2021. We will provide an update to enable the CAA to take account of final contract value in the final NPP.

The consequences of the CAA proposals would be as follows:

- › As it is not feasible to increase the contribution of non-regulatory income to the single till, if the NPP proposals are adopted without change, we would need to make operating cost reductions of £49m in addition to the CAA's proposed £71m reduction in operating costs.

- › It is not plausible to make cost reductions of this scale. In addition to the consequences described in our comments on the NPP's proposed £71m operating cost reduction, we would need to further reduce our operational ATCO headcount, and we would lack resources to train operational staff on the new equipment and procedures. As a result, we would not be able to implement any transitions for the technology and airspace modernisation programmes – either in RP3 or future reference periods.
- › In our RP3 Business Plan, we estimated that failure to deliver airspace modernisation in RP3 would lead to an additional 7 seconds of delay per flight by the end of RP3. The lack of technology change and resultant inability to modernise the airspace, combined with the effects of reduced ATCO headcount and the continued growth in traffic, would lead to a further significant deterioration of service performance in future reference periods. In addition, because we would be using obsolete technology, there would also be a heightened risk of technical failure.

To address our concerns, the CAA could:

- › Revise the NPP to reflect the projected non-regulatory income as set out in our RP3 Business Plan.
- › Adjust the value of the FMARS contract so that it is presented on identical inflation assumptions as the rest of the NPP.
- › Adjust the proposed non-regulatory income to take account of the impact of moving Biggin Hill airport within the scope of the London Approach service.

7.3. Pension costs

The CAA have proposed:

- › Reducing our projected pension contributions in RP3 by excluding Defined Benefit (DB) scheme deficit repair payments from 2022 (£36m) and by applying the CAA's overall operating costs efficiency assumptions to our DB and DC scheme projections (£12m):

The CAA offer the following justifications for its proposals:

- › There is potential for a lower levels of prudence in future DB scheme valuation assumptions reflecting strong regulatory protections around pension costs; there is a reasonable possibility of a surplus arising at the next DB pensions valuation for 2020; and, there is a lack of information or comfort around how the risk of a trapped surplus would be managed in the interests of customers;
- › Overall operating cost efficiency assumptions made by the CAA should apply to pensions given they form part of the overall staff compensation package.

NERL's view on the CAA's justification is as follows:

- › The CAA's assumption that there is scope for a lower level of prudence in future DB scheme valuation assumptions by reflecting the "strong regulatory protections around pension costs" is a mistake of fact. As part of each valuation the Trustee assesses the strength of NERL's covenant, with the help of a specialist covenant advisor Penfida. This assessment is used to set the level of prudence in the valuation assumptions, and already takes into

account the full range of regulatory mechanisms for addressing risk. This includes traffic risk sharing and pass through arrangements relating to capex and pension costs. It is worth noting that the pass through arrangements do not protect NERL from changes in assumptions on longevity which is a material risk. Also, the Government Actuary's Department (GAD) report on NERL's pension costs states that the level of prudence in the 2017 valuation was reasonable relative to wider UK practice, and that the discount rate used appeared to take account of the strength of the sponsor and the scheme's investment strategy¹⁰.

- › The CAA's assertion that there is a reasonable possibility there will be a surplus at the next DB pensions valuation for 2020 is at odds with the most recent evidence. The GAD report highlights that a surplus may arise earlier or *later* than 2022 depending on scheme experience and market conditions and that there is a 50% chance of a surplus emerging in that date. In fact, market conditions have deteriorated and there has been a widening of the DB pension scheme deficit since the Trustee's last valuation. The scheme actuary's latest annual update shows that the deficit has increased from £270m at 31 December 2017 to £433m at 31 December 2018. This is £163m higher and c£200m worse than expected at that date noting that some of the deficit should have been repaired. This highlights the extent of market uncertainty around the likelihood of a surplus at the 2020 valuation date. On the existing valuation basis an even higher deficit of this magnitude would lead to an increase in deficit repair payments for NERL of c £64m (2017 prices) in RP3.
- › The record since 2006 and to 2018 shows that the CAA's assumptions in regulatory settlements have been systematically optimistic and that NERL has always been in a position of having to recover higher pension contributions than the CAA assumed. To date these amount to £146m and most of this has yet to be recovered.

Table 3: Pension pass through additions to RAB since CP2

£m (2017 prices)	CP2	CP3 (to 31 December 2014)	RP2 forecast	Total
Pension pass through additions to RAB	86	18	42	146

- › The CAA's proposal does not appear to take account of the duties of Trustees under pension legislation in relation to any surplus should it arise. As set out in Appendix H (page 56) of NERL's RP3 Business Plan, if a surplus on the scheme arises in future then there would be consultation between the Trustees and the company to decide how the surplus would be managed, and NERL would appropriately consider customer interests. This could involve further de-risking of the scheme (which would reduce the volatility and risk of scheme funding) and/or contribution reduction below the underlying rate. This is evidenced by past history as shown in the table on the next page.

¹⁰ Government Actuary's Department, "Analysis of pension costs for NATS (En Route) plc, para 6.13 and table 6.2, September 2018

Table 4: Contributions to DB pension scheme costs 2001-2019

Cost and contributions (% of pensionable pay since the PPP)	Future service cost (as determined by scheme actuary)	Contributions			
		Normal	Deficit	Total	
Scheme funding position in surplus	9 months 2001	31.1%	3.3%	3.3%	
	2002	31.1%	0.0%	0.0%	
	2003	31.1%	0.0%	0.0%	
	2004	26.8%	9.0%	9.0%	
	2005	26.8%	10.8%	10.8%	
	2006	26.8%	12.2%	12.2%	
	2007	37.3%	12.2%	12.2%	
	2008	37.3%	20.0%	20.0%	
	2009	37.3%	25.0%	25.0%	
Scheme funding position in deficit	2010	36.7%	34.5%	34.5%	
	2011	36.7%	36.7%	8.8%	45.5%
	2012	36.7%	36.7%	9.0%	45.7%
	2013	29.4%	36.7%	9.3%	46.0%
	2014	29.4%	36.7%	9.8%	46.5%
	2015	29.4%	29.4%	11.0%	40.4%
	2016	31.8%	29.4%	12.0%	41.4%
	2017	31.8%	31.8%	21.6%	53.4%
	2018	41.7%	31.8%	25.7%	57.5%
	2019 (forecast)	41.7%	31.8%	27.5%	59.3%

The consequences of the CAA proposals would be as follows:

- › To add £36m to NERL's RP3 deficit funding requirement which, as discussed above, has widened by a further £64m reflecting deteriorating market conditions. This is on top of the £146m which NERL is still recovering relating to the period 2006 to 2019. This will serve to increase the charges to customers in future reference periods while reducing the relative charges to customers in RP3. The CAA will need to consider whether this is equitable.
- › In assessing the strength of NERL's covenant, Trustees are likely to attribute greater weight to the value of recovery of pension contributions sooner rather than later as this reduces regulatory uncertainty associated with future periods. The CAA's proposals could cause Trustees to adopt a margin for prudence which is higher than otherwise required and with it a request of NERL to pay higher contributions.

To address our concerns, the CAA could:

- › Allow in determined costs the £36m of projected deficit repair payments from 2022.
- › Adjust the allowance for ongoing pension costs in line with any adjustments made to its overall operating cost efficiency assumption as a result of the consultation (for consistency).

7.4. Our views on whether the CAA should consider issuing a Regulatory Policy Statement in respect of its pensions policy

For reasons set out below, we strongly support a Regulatory Policy Statement (RPS) relating to our DB pension costs.

The CAA have invited views from stakeholders on the value for customers from adopting a RPS which would reinforce the CAA's commitment to stand behind NERL's covenant to honour its pension commitments.

The CAA offer the following justifications for their consultation on the RPS:

- › A draft RPS from NERL which the company expects would allow trustees of the DB pension scheme to place greater reliance on the employer's covenant. This would enable higher investment returns to be targeted and could lower expected long-term pension contributions and therefore prices to customers.
- › A letter from trustees to the CAA in January 2019 suggesting that an appropriately drafted RPS could provide greater certainty and avoid a reduction in the assumption on investment returns which could otherwise arise from a lack of clarity around the continued application of the regulatory framework under the SES Performance Scheme.
- › Acknowledgement by the CAA that they consider that it is in the best long-term interest of customers to continue to stand behind NERL's covenant to honour its pension commitments and provide for the efficient costs of NERL servicing these obligations. The existence of a RPS would be a strong signal as to how they would be expected to act when setting future price controls. To the extent that this reduces regulatory discretion, the CAA considers it important that the introduction of such a statement can be seen as providing a clear benefit to customers.

NERL's view on the CAA's proposal is as follows:

- › Since the publication of the CAA's draft proposals on the UK RP3 Performance Plan, we have agreed with the trustees a set of guiding principles for establishing a framework for long-term planning, strategy and de-risking. These enable the expected development of the assets and liabilities of the scheme to the point of full funding to be defined and expressed as a "journey plan", with metrics for monitoring progress and with a framework for decision making if the funding outcome exceeds or falls short of expectations.
- › The planning framework allows for the trustees to revert to NATS if necessary to consider material changes in the funding level or covenant, and in turn fulfil their obligations under the trust deed and rules and pension legislation.

- › NATS and trustees are aligned on a long-term funding objective over 15-20 years of gilts+0.5%. However, in order to provide a degree of protection against a weakening of the covenant in the medium term and due to the uncertainty over the longer term covenant, the trustees retained an even longer term target of 100% funded on a gilts+0.25% basis (over 25-30 years). However, their intention is that this target would not impact investment decisions until the long-term target has been achieved. At that point any decision to continue to gilts+0.25% would be taken by trustees in agreement with NATS and is likely to be driven by an assessment of the strength of the employer's covenant at the time.
- › We believe the provision of a RPS reinforcing the CAA's commitment to stand behind NERL's covenant to honour its pension contributions further cements the alignment between NATS and trustees on the long-term funding objective and guiding principles and potentially reduces the trustees' need for an even longer term target (over 25-30 years). As noted in Appendix H of our RP3 Business Plan targeting additional returns of 25bps in the long-term funding target and investment strategy would reduce the assets expected to be needed today by around £400m, to pay for the benefits of the scheme. As such, we believe that the expected costs and company contributions would be lower in future with a RPS than they would otherwise be for any given set of market conditions without a RPS.

For these reasons, we are strongly supportive of the provision of a RPS as we can see the potential for customer value being realised

7.5. Capital expenditure

The CAA have proposed:

- › To allow all the capital expenditure NERL has requested for its role in airspace modernisation (£115m) and £552m of other forecast spending (including the £34m identified as contingency).
- › This means that the NPP has reduced the value of NERL's capital expenditure programme by £48m over RP3.

The CAA offer the following justifications for their proposals:

- › The CAA have made the reduction 'based on a lack of confidence in the cost efficiency of NERL's proposed programme as a whole', noting that there is a degree of uncertainty over the level of efficient spending.
- › The CAA have assumed that NERL will be able to realise £48m of savings.
- › The CAA note their proposal is less than a third of the total possible savings and contingency identified by Steer/Helios and represents one half of the costs of the TC Foursight programme.
- › The CAA note that the regulatory framework provides for a true-up mechanism for capital expenditure, such that where NERL's efficient capital expenditure is greater than the CAA have allowed in the Determined Costs, we can recover our actual costs in future reference periods.

NERL's view on the CAA's justification is as follows:

- › No evidence is provided by the CAA to support their assertion that they have a 'lack of confidence in the cost efficiency of NERL's proposed programme as a whole'. We have

provided the CAA, customers and consultants with comprehensive details of our programme and the approaches we take to ensure value for money is assured.

- › The CAA presents no impact assessment or rationale for the trade-off for the proposed £48m reduction. Given the highly integrated nature of NERL's plan, it is not credible for the CAA to make this assumption without assessing the impact on safety, service and environmental performance, costs, and on the airspace and technology programmes.
- › The CAA appears to place undue weight on the findings of the Steer report, despite recognising that the report is a very high level analysis. Also, the Steer report does not provide any impact assessment of its proposed reductions. Therefore, we do not consider that the Steer report is a credible piece of evidence which can be relied on by the CAA.
- › Although a capex true up mechanism exists, the CAA's proposal for a reduction of £48m in capex does not recognise the highly integrated nature of NERL's plan, and the corresponding impact on NERL's operating cost plans and programme risks. Reductions in capex of this nature can lead to stranded operating costs, loss of critical resources and skills, and a sub-optimal investment programme.
- › The NPP proposal does not take into account the views of customers. As noted in the CCWG co-chairs report, there was full agreement on the scope of the investment programme.

The consequences of the CAA's proposals would be as follows:

- › To meet the CAA's proposed capex reduction of £48m over RP3, we would need to reduce the scope of our investment programme and reprofile milestones to enable efficient resourcing.
- › In this instance, our investment priority would focus on the sustainment of the current infrastructure to ensure our day-to-day service performance is maintained. Therefore, a disproportionate challenge to the DSESAR investment would delay these milestones.
- › To achieve the capex reduction, we would need delay deployment of Foursight for Lower airspace into RP4. Foursight will enable trajectory planning, conflict detection and conformance, and monitoring in lower airspace. This means that the benefits of Foursight for Lower airspace (increased efficiency/capacity) will be delayed further into RP4 than scheduled in our RP3 Business Plan.
- › This reduction in scope would mean that people who had been supporting capital projects, e.g. DP Lower, would become either partially or fully under utilised on the capital programme. People whose time is partially under utilised will continue to support other capital programme and opex work, but a proportion of their labour costs will become stranded. Other peoples' time will become wholly unfunded. As a consequence, we would need to make their roles redundant in 2023 and 2024 resulting in a loss of their skills and experience, only to have to rehire the same skills in 2025 to deliver Foursight for Lower airspace in RP4. We estimate that the additional allowances needed to cover stranded labour costs and/or redundancy would range from £12.5m to £20m. There would also be some inefficiency and increased risk as new employees will need to be recruited and develop the same skills and experience as those who were released.
- › Therefore, the impact of reducing the size of the capital programme would not reduce prices during RP3, because lower depreciation and return costs would be offset by higher operating costs.

- › Finally, it should also be noted that the CAA's proposed operating costs allowance will impact the capital expenditure programme in RP3. The impacts are described in the operating costs section, above.

To address our concerns, the CAA could:

- › Allow the level of capital expenditure proposed in our RP3 Business Plan so that productive work can be made on Foursight for Lower airspace enabling benefits for our customers sooner.

If the capital expenditure proposals in the final NPP are unchanged, the CAA should recognise the implications of delaying Foursight for Lower Airspace into RP4 and include allowances for stranded costs and/or redundancies in the range from £12.5m to £20m.

7.6. Capex governance

The CAA state that the current governance arrangements are insufficient to provide airspace users and other stakeholders with an appropriate degree of comfort with respect to its capital expenditure plans.

Therefore, in the NPP, the CAA propose a number of measures to strengthen capex governance including:

- › NERL to provide airspace users with timely and regular updates on its approach to options appraisal, before it makes final decisions to commit to major projects.
- › If NERL and airspace users cannot agree on a preferred option, an escalation process to senior stakeholders (including CAA and DfT (if related to airspace), airports (dependent on subject) and airlines) would be triggered.
- › The role of the Independent Reviewer to be enhanced to include assessing how well NERL has explained and justified its capital programme in its Service and Investment Plan (SIP), as well as reviewing its reporting.
- › The Independent Reviewer will report both to the CAA and airspace users, and these reports will (inter alia) inform the CAA's decision on whether capital spending should be allowed in the Regulatory Asset Base (RAB) following their ex-post reviews of capital efficiency. Adjustments would be made in the reference period following that in which the spending has been incurred. If we do not provide persuasive evidence that spending has been efficiently incurred the CAA may exclude such spending from NERL's RAB;
- › If there are significant weaknesses in NERL's ongoing provision of information on its capital spending then any overspend during RP3 will only be remunerated at its cost of new debt finance (rather than the full WACC) during RP3, even if it subsequently passes an efficiency test. As noted above inefficient spending may not be added to the RAB.

We accept the need for appropriate governance and oversight of the capex programme including clear and transparent reporting and customer involvement in key decisions where the portfolio may need to change. We have been working closely with customers to develop revised governance proposals, which have been broadly supported, and we request that the CAA supports NERL to implement the revised SIP process which will provide assurance to key stakeholders on the efficient use of capital.

Customers value the opportunity to review progress in delivery of the investment programme and, more importantly, the realisation of its benefits. Customers have expressed a keen desire to be involved in appropriate 'optioneering' at relevant points in the programme. However, customers also recognised the need to allow NERL the accountability and flexibility to manage the agreed programme. On this basis, we have proposed an enhanced reporting regime with a clear approach to reviewing changes and an escalation process when agreement cannot be reached.

The additional changes proposed in the NPP would significantly constrain our ability to manage the capital investment programme, as they introduce additional governance for agreed programmes and restrict access to essential contingency funds. Therefore, the changes would add cost and delay into the change portfolio and potentially dilute NERL's accountability for the overall capex programme.

While we support the potential wider role of the Independent Reviewer in the capex programme, it would not be in line with regulatory best practice to assess efficiency of expenditure every six months. While it is reasonable to assess progress every six months, cost efficiency needs to be assessed at longer intervals when a broader view of overall delivery performance can be assessed consistent with the longer term timeframe of these programmes. The proposed changes to the Independent Reviewer role appear to blur the lines of accountability away from the core role from reporting on programme progress. For NERL to be held accountable for the capex programme, we believe it would be appropriate to assess the efficiency of our expenditure in RP3 at the beginning of RP4. We would also require guidance from the CAA on the assessment criteria and methodology that will be used.

We are also concerned that the NPP appears to imply that SIP approval will be required before major programmes are included in the approved portfolio, and that contingency is placed under direct control of customers through additional SIP governance. This risks adding confused accountabilities, potential delay and increased costs. Further views on capex contingency are provided as part of our response on uncertainty mechanisms (see Chapter 9).

The views expressed above are our initial views pending sight of the draft Licence modification on capex governance that the CAA will consult on.

7.7. Consistency of our proposal with EU-wide targets

The CAA's proposals for NERL propose a cost efficiency target of 4.3% p.a. which is significantly in excess of the EU-wide target of 1.9% p.a. which was adopted at an ad hoc SSC in April 2019.

Our customers' priorities for RP3 are on service quality, resilience and airspace modernisation. With the additional scope in other areas, such as cyber security, drones and the requirement to fund our future ATM capabilities given the loss of SESAR income post Brexit, it is not logical that the NPP's cost efficiency target is so far in excess of the EU-wide target.

In addition, UK traffic growth in RP3 will be lower than EU-wide traffic growth (our NATS December 2018 base case forecasts 2.2% average annual growth in TSUs, while the STATFOR February 2019 base case which forecasts 2.7% average annual growth for Europe). In addition, historically, the UK has delivered significantly greater cost reductions in previous reference periods than comparators. Both of these facts mean it is even more challenging for the UK to make the same cost efficiency savings in RP3 as other States, and it would be unrealistic to achieve this without impacting service performance and delivery of the technology programme and airspace modernisation.

Under our response to this consultation (which uses the NATS December 2018 traffic forecast, adopts our proposals for operating costs (including reinstating all airspace modernisation costs), non-regulatory income and cost of capital, and implements the proposed capital expenditure reductions with allowances for restructuring and stranded labour), the NERL DUC would decrease by 2.7% p.a.

Our proposal would still enable NERL to meet the assessment criteria set out in Annex IV of the performance and charging Regulation:

- › **RP3 determined unit cost trend:** Proposal of 2.7% p.a. reduction in RP3, compared to the EU-wide target of 1.9% p.a. reduction.
- › **Long term determined unit cost trend:** Proposal of 2.9% p.a. reduction in RP2 and RP3 combined, compared to a combined EU-wide target of 2.7% p.a. (3.4% in RP2, 1.9% p.a. in RP3).

We note that the third assessment criterion is a comparison of the determined unit cost baseline with NERL's comparator group. We have not been able to assess our proposal against this criterion as the baseline for our comparator group is unknown.

For the reasons above, we propose the CAA reconsiders the level of cost efficiency within their draft NPP to a lower, more appropriate level.

7.8. Airspace modernisation

The CAA have reiterated that the air traffic services we provide are of national importance. It proposes that we should have a key role in supporting the development and implementation of the modernisation of airspace, which the CAA describe as a crucial part of the UK's national infrastructure that needs to be maintained and enhanced for the benefits of airspace users, consumers and communities. We welcome this, and our role in the ACOG.

However, in order to accept the responsibility and accountability placed on us under associated licence modifications we will need to be satisfied that we have a reasonable prospect of fulfilling them. We are still working with the CAA to clarify their expectations in relation to airspace change and wider areas such as electronic conspicuity and drones. We hope to reach a conclusion on the licence modifications that will enable us to assess fully the resource requirements, costs and risks to the NPP involved in fulfilling those expectations. Without that clarity, and certainty that we have all the funding for the required resources to modernise UK airspace including funding for our role in the ACOG, we would be unable to agree to any final settlement.

In addition to the funding requirements, there is a practical issue that we face as both a facilitator of the ACOG organisation and as a proposer of airspace change. Ultimately we need to make informed and expert proposals to the Secretary of State in respect of the national airspace plan, and to the CAA in respect of individual airspace change proposals. The final decision on implementation and approval of those proposals lies outside of NERL's control. Although we await the CAA's final proposals for licence change in these areas, we expect those proposals to frame our responsibility and accountability taking into account these limitations on our influence.

8. NERL's response to Chapter 6: Overall costs

CAA question:

We welcome representations on any aspect of the issues raised in this chapter and in particular the forecasts of Met Office costs, the UK's share of Eurocontrol costs and CAA costs.

Our main area of feedback on the draft NPP proposals on overall costs is that there are additional saving demands being placed on us because of increased costs elsewhere, particularly in the CAA. Given that the EU-wide efficiency targets apply at national level, it does not seem appropriate that NERL should be the only organisation making a material contribution towards them.

9. NERL's response to Chapter 7: Financeability

CAA question:

We would welcome views on any aspect of the issues raised in this chapter and, in particular, on our approach to the cost of capital and financeability.

Our main areas of feedback on the draft NPP's cost of capital proposals are as follows:

- > The CAA's proposed cost of capital is materially understated and is not commensurate with the risks faced by the business, including demand risk, the fixity of our costs, and asymmetric risks from Brexit and the proposed the incentive regime.
- > In addition, the evidence put forward in support of the CAA's proposals: contains significant errors made by their consultants Europe Economics; deviates from regulatory precedent; and fails to take due account of all the evidence presented by NERL. As a result, the CAA's proposed reduction in the cost of capital is too large and is unjustifiable.
- > Our counter-proposal corrects these errors and sets out a revised range for several parameters within the cost of capital, which better reflect the array of available evidence and regulatory precedent, and presents a revised point estimate of 4.21% for the vanilla (post-tax), real WACC. We consider that this sets out a more plausible and justifiable basis for determining the cost of capital for RP3.

Our main area of feedback on financeability is that:

- > Taken together, the CAA's current proposed adjustments to NERL's RP3 Business Plan, pose challenges to NERL's financeability, contrary to the duties of the CAA and the DfT under the requirements of the Transport Act 2000. We find that the CAA's proposals are unlikely to be consistent with NERL maintaining a solid investment grade credit rating, and the expected return to providers of equity is negative.

We set out below our response to the CAA's questions in relation to cost of capital, NERL's RAB, regulatory depreciation, inflation and financeability.

9.1. Cost of capital

The CAA have proposed a pre-tax WACC of 2.84% (in RPI terms), significantly lower than both the pre-tax WACC of 5.07% that was proposed by NERL and the pre-tax WACC of 5.86% used at RP2.

The CAA offer the following justifications for their proposals:

- › Further evidence on risks that NERL faces relative to the market point to reductions in the required cost of equity.
- › Recent market trends and regulatory precedent point to sharp reductions in expected equity returns and the risk-free rate since RP2.
- › The cost of new investment grade debt has reduced since RP2 and the proportion of new debt that NERL expects to raise in RP3 is higher than in RP2.
- › The estimated effective tax rate for NERL has reduced.

We provide a summary of our views on the CAA's cost of capital proposal below, with reference to a report by NERA. Our more detailed views on each of the elements are provided from section 9.1.1 onwards.

Risks that NERL faces relative to the market: the CAA provide no justification for why the asset beta should fall in RP3. In addition, NERA have identified errors and flawed assumptions in the Europe Economics analysis. As such the CAA's proposal of 0.46 for the asset beta significantly understates the risks NERL faces relative to the market.

Further, the sense checks performed by the CAA in relation to the proposed asset beta fail to consider previous CAA determinations or the increases in asset beta of listed airports and of UK utilities since the start of RP2.

Applying the general approach of the CAA for estimating NERL's asset beta for RP3, with emphasis on the asset beta of ENAV, NERA estimate NERL's asset beta to be in the range of 0.53-0.58 (at a debt beta of 0.05). This is more in line with previous CAA determinations (0.505 at RP2 and 0.60 at RP1), with NERA's analysis of airport comparators which supports an asset beta for NERL of 0.58, and with a lack evidence, apart from Brexit risks, of any significant change to NERL specific risk over those periods.

NERA recommend that the point estimate for NERL's asset beta should lie towards the top end of the ENAV range of 0.53 – 0.58 (at a debt beta of 0.05), given NERL's greater exposure to traffic risk compared to ENAV. We conclude that this is appropriate. We propose a point estimate of 0.57 (at a debt beta of 0.05), from the NERA range. We consider this would also reflect the asymmetric risk to traffic in RP3 as a result of Brexit.

Debt beta: NERA find little support for the CAA's assumption to set the debt beta for NERL at 0.13. NERA consider that the CAA have erroneously reached this conclusion by placing too much weight on very limited evidence presented by Europe Economics and PwC, and they have ignored the wider academic literature on debt betas. In response to the CAA's proposals on debt beta, NERA have considered evidence presented by Professor Ania Zalewska in 2019 from the University of Bath on debt betas using NERL and Heathrow airport bonds, as well as iBoxx indices. Professor Zalewska concludes that there is evidence that the debt beta from the NERL bond is significantly smaller than 0.1 and not statistically different from zero.

The work undertaken by Professor Zalewska is substantially more rigorous than the work undertaken by either PwC or Europe Economics on the issue of debt beta since she has derived debt betas using a variety of methods (OLS, Garch, Kalman-Filter) and considered the sensitivities of the results to alternative model specifications. NERA conclude that the plausible value for NERL's debt beta in RP3 lies in a range of zero to 0.1. A debt beta of 0.1, as chosen by the CAA at RP2, is consistent with PwC's own debt beta analysis and proposals by Ofwat and Ofcom, while a debt beta of 0 is consistent with the empirical analysis of Professor Zalewska and also of work undertaken by academics, Schaefer and Myers, during the Q5 review for UK airports. We find that the direct evidence from analysis of NERL's bond provides a strong case for the debt beta point estimate in RP3 to be zero. However, we conclude that on balance some weight should be given to the indirect methods used in regulatory precedent and as such we maintain our view that a point estimate of 0.05 is appropriate.

Expected equity returns: NERA find that there is little evidence to support the CAA's premise that total market return has fallen since RP2. In their report, NERA demonstrate that a robust assessment of historical data shows no reduction in realised returns over the recent period across global equity markets, despite the fall in risk-free rates since RP2. Equally, forward looking evidence from dividend growth models (DGM), including PwC's own evidence, shows no reduction in expected total market return estimates relative to RP2. Similarly, forward-looking survey evidence presented by NERA shows no reduction in expected total market return either. NERA concludes that all of this evidence supports the notion of a broadly constant total market return over time, and provides no reason for the CAA to reduce its estimate from RP2, which was already lower than the latest estimate from the Competition and Markets Authority (CMA) of 6.5% from the Northern Ireland Electricity (NIE) 2014 and Bristol Water 2015 determinations.

In their report, NERA highlight that the CAA's estimated total market return and point estimate rely on selective evidence, elements of which are also flawed. Examples include: the conclusions on historical inflation and the predictability of returns within the UKRN report; and, the reliance by PwC on UK GDP forecasts when estimating investors' expectations of dividends and earnings forecasts for FTSE stocks.

NERA conclude on a total market return range for RP3 of 6.2% - 6.8% (RPI-deflated) drawing on historical evidence but with a cross check to forward looking estimates. This compares with the CAA's range of 5.0% - 6.25%. Taking into account both ranges, we consider that selecting a point estimate (6.25%) at the upper bound of the CAA's proposed range for RP3 would be more consistent with latest CMA precedent of aiming up within total market return ranges, reduce the risk that the CAA's current point estimate is underestimating the total market return and yet still be consistent with the CAA's range overall. Using the NERA proposed total market return range alongside the CAA's own evidence would result in a more appropriate and, importantly, more reliable point estimate.

Risk-free rate: we conclude that the CAA's approach and proposals are not unreasonable.

Cost of debt: we conclude that the CAA's proposals are broadly appropriate, but that the Europe Economics' incorrectly assume that new debt should have a tenor of around 10 years, rather than the 10 - 15 year period assumed in RP2, which is also more consistent with the 15 year period of regulatory depreciation. We also propose amendments to the inflation forecasts that would reduce the cost of embedded debt by 10-20bps. After adjusting for these factors, the CAA's point estimate of 0.86% for the cost of debt would increase to 1.07%, near the upper bound of the CAA's proposed range.

Tax uplift: we agree with the CAA's proposals. However, the calculation of the tax uplift will need to be updated again upon completion of the CAP1758 consultation.

The consequences of the CAA proposals are that the pre-tax WACC is materially understated and does not reflect the level of return needed to compensate NERL for the risks it faces.

To address our concerns, the CAA could:

- › Adopt point estimates of 6.25% for total market return, 0.57 for asset beta and 0.05 for debt beta.
- › Select a point estimate for the cost of debt of 1.07%.
- › Maintain the point estimate for the risk-free rate of -1.40%.
- › Maintain the gearing assumption at 60%.
- › Maintain the same approach to the calculation of the tax uplift.

With these adjustments, the point estimate of the vanilla (post-tax), real WACC would be 4.21%. Our proposed point estimate would represent a reduction of 30bps relative to NERL's RP3 Business Plan, largely reflecting greater weight being placed on ENAV's asset beta and new analysis undertaken by NERA in relation to total market return.

9.1.1. Asset beta

The CAA have proposed a range for the asset beta of 0.46 – 0.505, and are proposing to use 0.46 as the point estimate. The lower end of the range is from Europe Economics' analysis, while the upper end was the allowed asset beta at RP2. The CAA explains that the point estimate of 0.46 is based on the estimate from Europe Economics, which is slightly above the mid-point in Europe Economics' estimate of ENAV's asset beta and is within the relevant bound from a selection of utility and airport comparators.

The CAA offer the following justifications for their proposals:

- › The CAA consider that 0.46 is a reasonable estimate of ENAV's asset beta by putting weight on the estimated beta over a longer timeframe (2 years, rather than 1 year) and by considering movements against an Italian domestic index.
- › Although NERA provided evidence that NERL's beta should be higher than ENAV, CEPA provided evidence to support the opposite. As a result, CAA have stated that it is not clear that an adjustment to ENAV's beta is needed in addition to the adjustment applied by Europe Economics for NERL's higher operating leverage.
- › The CAA have sense checked their point estimate of 0.46 against recent regulatory precedent, noting that this is significantly above recent estimates from Ofwat (0.37 in the PR19 guidance) and Ofgem (0.35 - 0.36 in the RIIO-2 methodology consultation), and slightly below the mid-point of PwC's estimate range for Heathrow airport (0.42 – 0.52). As such the CAA concluded that the estimate of 0.46 seemed broadly consistent with Europe Economics' conclusion that NERL's asset beta should be below that of UK airports.
- › The CAA justify not making additional adjustments to reflect the performance regulation, as NERL will continue to have strong protections against elements of systematic risks from traffic risk-sharing and pension pass-through.

NERL's view on the CAA's justification is as follows:

- › We agree with the CAA that ENAV is now a suitable comparator for NERL. However, we find that the detailed approach taken by the CAA generates an asset beta assumption that simply is not plausible given that the asset betas of comparators have increased since RP2. NERA have identified errors and flawed assumptions in the Europe Economics analysis that the CAA are relying on, and a summary of these is set out below. However, we consider it is important that in addition to this bottom up approach to beta estimation, the CAA should also take more account of the following relevant factors:
 - › Previous regulatory precedents for NERL's asset beta of 0.505 (at a debt beta of 0.1) at RP2 and 0.60 (at a debt beta of 0.1) at RP1 both took into consideration the traffic volume risk sharing mechanism and pension pass through arrangements which remain unchanged from RP2 to RP3. Therefore, these point estimates and the previous ranges of 0.49 – 0.52 from PwC at RP2 and 0.50 – 0.60 from Europe Economics at RP1 remain a relevant starting point for NERL's asset beta in RP3.
 - › The most notable change in demand risk faced by NERL since RP2 is that Brexit creates a downward bias to traffic risk. In other words it is more likely as a result of Brexit that traffic will be lower, rather than higher, than the base case forecasts. However, in addition to this the proposed incentive mechanisms are now asymmetric, with NERL facing greater downside risk. These mean that, all other factors being equal, NERL's asset beta should be higher than at RP2.
 - › The asset betas of comparators have generally increased since RP2 and this points to an increase in NERL's asset beta. As shown in the appendix of Europe Economics' report (page 81), the asset betas of the two most relevant listed airports (Aeroports de Paris (AdP) and Fraport) have both increased since the start of RP2 by around 10 – 15 bps. This general increase in asset betas over this period is also supported by the charts presented by Europe Economics (pages 68 – 70) that show increases in the asset beta for National Grid (up around 10 bps), Pennon (up 10 – 20 bps), SSE (up around 5 bps), United Utilities (up 15 - 20 bps) and no significant change for Severn Trent.
 - › As such, in the context of the RP2 and RP1 determinations, risks arising from Brexit and the general rising asset betas for comparator companies the CAA's proposals look inappropriate and significantly underestimate NERL's asset beta.

In the paragraphs that follow, we consider in more detail the detailed steps that the CAA have undertaken to form a view on the asset beta for NERL in RP3, and by correcting the errors and flawed assumptions made by Europe Economics, NERA reaches a revised range for NERL's asset beta of 0.53 – 0.58 (at a debt beta of 0.05). Such a range would be more consistent with the broader changes since RP2 referenced above.

- › We agree that ENAV's two year asset beta is a relevant reference point for assessing NERL's asset beta. However, the use of an Italian domestic index and in particular the large cap Italian domestic index (with only 40 companies) used by Europe Economics to calculate ENAV's asset beta is not appropriate. Instead ENAV's asset beta should be calculated using a wider European index for the following reasons:
 - › NERA's analysis of the shareholder composition of ENAV shows that the investor base is highly international with a number of large international investment funds holding stakes. NERA argue that it follows that the Italian index is not a representative

benchmark for these investors when calculating beta. Moreover, the local index used by Europe Economics does not even include ENAV and therefore clearly cannot represent the investment universe for investors in these assets.

- › The wider European benchmark (Stoxx Europe 600 index) is more similar to UK FTSE than the local Italian index. Given that the overall purpose is to estimate a beta for NERL, the reference market for comparator companies should be similar to the UK stock market. In their report, NERA show that the Stoxx Europe 600 index is similar to the FTSE All Share index in terms of size and sector composition, further supporting the use of a Europe wide index as the market benchmark. Although AdP and Fraport are included in the Stoxx Europe 600 index, ENAV is not. ENAV is instead included in the wider Stoxx All Europe index. NERA have tested the sensitivity of the ENAV asset beta estimated against both these indices and find no difference in the resulting asset beta estimates. NERA therefore use the Stoxx Europe 600 index for ENAV, in line with its estimates for AdP and Fraport.
- › NERA also find that the conversion by Europe Economics of ENAV's asset beta to an estimate of NERL's asset beta contains an error which understates NERL's asset beta. Europe Economics deconstructed ENAV's asset beta into two parts: the first related to ENAV's en route services and the second related to ENAV's terminal services. During this process, Europe Economics made the flawed assumption that the asset beta of terminal services was higher than for en route services. In fact, the reverse is true and therefore the NPP contains a clear error. NERA present evidence taken from ENAV's latest presentation to investors and also evidence from their IPO prospectus that shows both quantitatively and qualitatively that the en route services have a higher asset beta than the terminal services. The correction of this error by NERA shows that the asset beta for ENAV's en route services should be *higher* by 8% than ENAV's total asset beta.
- › Europe Economics correctly identify that NERL is exposed to greater traffic and operational leverage risks compared to ENAV and correctly conclude that NERL's en-route beta should lie above ENAV's en-route beta. However, NERA find that Europe Economics' proposed 9% adjustment for greater operational leverage lies at the bottom end of plausible adjustments and should therefore be considered as a lower bound on the necessary adjustment.
- › NERA conclude that the evidence from ENAV supports an asset beta for NERL of 0.53 to 0.58 (at a debt beta of 0.05), when correctly estimated against a European benchmark index and adjusted for NERL relative risk.
- › The NPP offers no justification for the upper bound of the asset beta range for NERL, aside from it being the point estimate from RP2, notwithstanding that the range proposed by Europe Economics had a higher upper bound. Further, in considering their upper bound, Europe Economics commented that they "believed that NERL's asset beta should be expected to be lower than that of UK airports. This is due to the fact that NERL's demand diversifies fluctuations in individual airport demand and is also more globally diversified."
- › We agree that the traffic handled by NERL is more diversified than that of UK airports. However, the airports are more diversified in terms of revenue streams. We, and NERA, disagree with Europe Economics' assumption that UK airport betas represent an upper bound on NERL risk. Moreover, NERA show that NERL is exposed to greater cash-flow volatility compared to Heathrow and Gatwick airports for a given change in volumes. As a result, NERA find no support for Europe Economics' assertion that NERL is lower risk compared to UK airports. As explained in their March 2018 report, NERA consider the closest comparator for NERL is AdP, given similar exposure to underlying demand risk and

noting that AdP is also subject to a volume risk sharing mechanism. Updated evidence presented by NERA supports an asset beta for AdP of 0.58, which is also consistent with the average beta for the wider airport comparator set. We also note that the CAA's own regulatory precedent at RP2 and RP1 has been for NERL's asset beta to be higher than that of Heathrow.

- › The CAA have stated that they sense checked their point estimate against recent regulatory precedent, noting that this is significantly above recent estimates from Ofwat (0.37 in the PR19 guidance) and Ofgem (0.35 - 0.36 in the RII0-2 methodology consultation), and slightly below the mid-point of PwC's estimate range for Heathrow airport (0.42 – 0.52). However, the CAA have not sense checked their point estimate against either their own regulatory precedent (see above) or seemingly against the general increase in asset beta of comparators since RP2.
- › Finally, the CAA fail to give adequate consideration to factors that are expected to increase NERL's risk profile, relative to RP2. These include the following:
 - › The risk of the traffic forecast being achieved (and along with it revenues) is asymmetric because of Brexit. The CAA do not appear to draw this factor out as being a significant new risk factor in RP3 and as such reflect it in their assessment of NERL's asset beta. It is also a risk factor that is not expected to impact ENAV or indeed UK utilities to nearly the same extent as NERL.
 - › In addition to the amount of potential bonuses and penalties increasing, asymmetry has also been introduced creating a downside risk greater than any upside opportunity. The maximum capacity bonus in RP3 is 1.5% or an average of c£9m p.a. in 2017 prices (RP2: 1.0% and c£6m in 2017 prices) and the maximum capacity penalty in RP3 is 2.25% or an average of c£13m p.a. in 2017 prices (RP2: 1% and c£6m in 2017 prices). The maximum environmental bonus and penalty in RP3 is 1.0% or an average of c£6m p.a. in 2017 prices (RP2: 1% and c£6m in 2017 prices).
 - › As proposed in the NPP, NERL would incur C2 and 3Di penalties each year. However, aside from this factor, the risk of incurring penalties has increased relative to RP2 due to higher forecast traffic and the number (7) and the size of the transitions in RP3 for airspace (multiple airspace deployments) and technology (new flight data processing system; new controller tools; new voice system; new data centre; new second systems across Prestwick, Swanwick, upper and lower airspace).
 - › Separately, the CAA's proposals in the draft NPP introduce increased risk that significantly reduces expected returns to investors (for example the expectation of C2 and 3Di penalties each year). Were the CAA not to adjust their proposals in line with NERL's response, then the cost of capital would need to be further increased to ensure that the expected regulatory return more closely aligned with the allowed regulatory return.

The consequences of the CAA's proposals on asset beta are that NERL's cost of capital for RP3 has been materially underestimated and fails to reflect the risks that NERL faces relative to the market.

To address our concerns, the CAA could:

- › Adopt a range for NERL's asset beta of 0.53 – 0.58 (at a debt beta of 0.05) as this range reflects the corrected evidence from ENAV and updated beta estimates for airport comparators.
- › Select a point estimate that lies towards the top of the range, such as 0.57 (at a debt beta of 0.05), given NERL's greater exposure to traffic risk compared to ENAV as well as the conservative adjustment for NERL's greater operational leverage, and the asymmetric traffic risk due to Brexit.

Our comments above on asset beta relate to NERL's en route service. In previous CAA determinations the en route cost of capital has been applied to oceanic. Arguably, however, the absence of traffic volume risk-sharing meant that the risk was higher. Recent developments such as currency risks associated with the satellite ADS-B data charges have added further risk to the oceanic service. Furthermore, as set out in our response to Chapter 11, the NPP introduces changes that make the oceanic service unsustainable were it to be a standalone business. If these factors are not to be remedied in the manner being proposed by NERL, a separate and higher cost of capital should be established for the oceanic service.

9.1.2. Debt beta

The CAA have proposed a debt beta of 0.13 to inform their overall WACC estimate in these draft proposals.

The justification offered by the CAA is that this debt beta of 0.13, and the proposed range for debt beta of 0.1 – 0.19, is supported by the findings of Europe Economics.

The CAA have commented that they have considered evidence from Europe Economics that the debt beta should be higher than the level set at RP2 (0.1), and have also noted that Ofgem has proposed a debt beta of 0.1 – 0.15 in their RIIO-2 methodology consultation and that Ofwat and Ofcom used a debt beta of 0.1 in recent publications. In addition, the CAA notes that PwC in their updated report for CAA have increased their debt beta assumption from 0.05 to 0.1 given recent market movements.

NERL's view on the CAA's justification is as follows:

- › There is little support for the CAA's assumption to set the debt beta for NERL at 0.13. NERA considers that the CAA have erroneously reached this conclusion by placing too much weight on very limited evidence presented by Europe Economics and PwC, and they have ignored the wider academic literature on debt betas.
- › The CAA's proposed range places insufficient weight on direct estimates of debt beta using NERL's bond. NERA have considered evidence presented by Professor Ania Zalewska in 2019 from the University of Bath on debt betas using NERL and Heathrow airport bonds, as well as iBoxx indices. Professor Zalewska concludes that there is evidence that the debt beta from the NERL bond is significantly smaller than 0.1 and not statistically different from zero. The work undertaken by Professor Zalewska is substantially more rigorous than the work undertaken by either PwC or Europe Economics on the issue of debt beta since she has derived debt betas using a variety of methods (OLS, Garch, Kalman-Filter) and considered the sensitivities of the results to alternative model specifications. NERA also highlight that other academics have also provided empirical debt estimates. For example,

during the Q5 review, BAA submitted two papers by Schaefer, S. and Myers, S. that provided empirical estimates for debt betas. These papers also showed debt betas below 0.1 for comparable rated debt to NERL (for Heathrow and Gatwick airports, Schaefer recommended a debt beta of 0.04, while Myers recommended a debt beta of 0 for comparable rated debt).

NERA conclude, and we agree, that the plausible value for NERL's debt beta in RP3 lies in a range of zero to 0.1. A debt beta of 0.1, as chosen by the CAA at RP2, is consistent with PwC's own debt beta analysis and proposals by Ofwat and Ofcom, while a debt beta of zero is consistent with the empirical analysis of Professor Zalewska and also of work undertaken by academics, Schaefer and Myers, during the Q5 review for UK airports. We find that the direct evidence from analysis of NERL's bond provides a strong case for the debt beta point estimate in RP3 to be zero. However, we conclude that on balance some weight should be given to the indirect methods used in regulatory precedent and as such we maintain our view that a point estimate of 0.05 is appropriate.

The consequences of the CAA proposals are that the proposed debt beta for RP3 is overstated.

To address our concerns, the CAA could:

- › Select a point estimate for the debt beta of 0.05 within a more plausible range of zero – 0.10.

9.1.3. Total market return

The CAA have proposed a range for total market return of 5.0% - 6.25% (in RPI-deflated terms) and a point estimate of 5.4%. This represents a significant reduction in the range that the CAA included at RP2 of 6.25% - 6.75% and the point estimate of 6.25%.

The justification offered by the CAA for the low end of the range is that it is in line with the low-end of total market return estimates based on average historical returns (from the UKRN cost of equity report), forward-looking returns (from PwC's report for CAA on H7 and from other advisors) and from regulatory precedent (Ofwat, Ofcom and Ofgem). The CAA states that the high end of the range is the CAA's estimate for RP2 and Q6 price controls. The CAA acknowledges that its proposed range for total market return lies significantly below the range from NERA of 6.5% - 7.1%, and asserts that NERA's view on total market return make them an outlier.

We believe the available evidence supports a higher range than the CAA proposes and that the total market return at RP2 of 6.25% remains appropriate for RP3, albeit towards the lower end of the plausible range. This is particularly the case when considered against the CMA final determinations in 2014 and 2015 in relation to NIE and Bristol Water which resulted in a total market return of 6.5% and the fact that NERA find that there is little evidence to support the CAA's premise that total market return has fallen since RP2.

In their report, NERA demonstrate that a robust assessment of historical data shows no reduction in realised returns over the recent period across global equity markets, despite the fall in risk-free rates since RP2. Equally, they highlight that forward looking evidence from dividend growth models (DGM), including PwC's own evidence, shows no reduction in expected total market return estimates relative to RP2. Similarly, forward-looking survey evidence presented by NERA shows no reduction in expected total market return either.

NERA conclude that all of this evidence supports the notion of a broadly constant total market return over time, and provides no reason for the CAA to reduce their estimate from RP2, which was already lower than the latest estimate from the Competition and Markets Authority (CMA) of 6.5% from the NIE 2014 and Bristol Water 2015 determinations.

In their report, NERA highlight that the CAA's estimated total market return and point estimate rely on selective evidence. In forming their proposed range, the CAA appear to mainly rely on the evidence in the UKRN report and in advice from PwC, both of which support unprecedentedly low total market return figures. NERA note that both UKRN's report and the PwC analysis depart substantially from regulatory precedent, including CMA precedent, and their research has not been subject to scrutiny in the refereed academic literature.

In addition, NERA show that the UKRN report upon which the CAA rely heavily understates the historical total market return due to flawed conclusions on historical inflation and the predictability of returns. The CAA estimate a historical total market return of 5% - 6% (RPI-deflated) based on the UKRN report. However, NERA show that the UKRN report historical total market return estimates are understated due to the authors:

- › Drawing on a hybrid RPI/CPI historical inflation series, which they incorrectly interpret to represent CPI inflation, thus understating historical real CPI-deflated returns (given RPI inflation is generally lower than CPI).
- › Applying an excessive adjustment for long holding periods and alleged predictability of returns, compared to established methods in financial literature as used by the CMA.

Correcting for the above issues, NERA calculate that the historical evidence supports a total market return range of 6.2% - 6.8% (RPI-deflated).

Further, NERA demonstrate why PwC's application of the DGM is flawed due to reliance on UK GDP forecasts as a basis for estimating investors' expectations of dividends and earnings forecasts for FTSE stocks. NERA show that PwC's DGM-based total market return estimates are understated due to their use of UK GDP growth to estimate future dividend growth even though the UK FTSE companies have 70% exposure to international markets where growth is higher. It is clearly not appropriate to rely so heavily on UK GDP particularly as the CMA used analyst forecasts rather than UK GDP in their 2014 and 2015 determinations for NIE and Bristol Water. If the CAA wish to use forward looking total market return estimates to form a view on the total market return for NERL in RP3 then they should ensure that the previous methods employed by the CMA (which point to a range of 7% - 8%) are not dismissed or ignored as they remain highly relevant indicators of total market return. Otherwise, the CAA's assessment of the total market return for RP3 relies on selective evidence.

Finally, the CAA have aligned the upper bound of their range with the point estimate from RP2, but have failed to give due consideration to the evidence that led to this decision for RP2. At the time, the CAA disclosed that in forming their view on the point estimate, from the range of 6.25% to 6.75% presented at that time by PwC, they selected a point estimate of 6.25% on the basis of the Competition Commission's (now CMA's) provisional determination on NIE of 6.0%. However, as the final determination for NIE was 6.5%, it would be more appropriate for the CAA to link its upper bound more closely to final CMA determination.

In conclusion, we find that the CAA have based the proposed significant reduction in total market return on a premise that is not supported by strong evidence. In addition, the justification for their proposed range is heavily reliant on analysis that NERA find to be flawed and the use of selective evidence that ignores methodology previously employed by the CMA. It is for these reasons that

we consider NERA's range of 6.2% - 6.8% to be more plausible. This being because, like NERA and also the authors of the UKRN report, we consider that greater weight should be placed on historical rather than forward looking estimates of total market return. As referenced above, we believe the available evidence supports a higher range than the CAA proposes and that the total market return at RP2 of 6.25% remains appropriate for RP3, albeit towards the lower end of the plausible range.

The consequences of the CAA proposals are that the cost of equity is understated.

To address our concerns, the CAA could:

- › Re-consider their position, in light of the evidence and arguments presented above and adopt a point estimate of 6.25%.

9.1.4. Risk-free rate

The CAA have proposed a risk-free rate of -1.4%.

The CAA justify this proposal using forward rates for index-linked gilts over 5-year to 20-year horizons.

The CAA's view is slightly different to the equivalent estimate from NERA of -1.1%. However, the likely impact of this difference on the overall cost of capital is relatively small.

The consequences of the CAA proposals are that the risk-free rate is not unreasonably estimated.

We do not propose any changes to the CAA's assumptions for the risk-free rate.

9.1.5. Gearing

The CAA have proposed a notional gearing assumption of 60%.

The justification offered by the CAA is that this is broadly consistent with wider UK regulatory precedent and was also recommended by Europe Economics as being an initial (pre-financeability testing) notional level of gearing.

We agree with the CAA's justification.

The consequences of the CAA proposals are that the notional gearing remains at 60%, in line with the gearing target in NERL's Licence.

We do not propose any changes to the CAA's assumptions for NERL's gearing.

9.1.6. Cost and proportion of embedded debt

The CAA have proposed a cost of embedded debt of 2.3%, based on the nominal yield at issuance of NERL's existing bond (5.4%), deflated by the CAA's RPI forecast of 3.0% for RP3. The CAA have concluded that it appears reasonable to assume that embedded debt represents 30% of total debt in RP3.

The justification provided by the CAA for the cost of embedded debt is that PwC reviewed the efficiency of the cost of the existing bond for CAA at RP2, without identifying any issues. The

justification provided by the CAA for the proportion of embedded debt was that this conclusion was formed after reviewing the average proportions of embedded and new debt in RP3 from our RP3 Business Plan.

Subject to adjustments that we consider the CAA should make in applying its approach to inflation (see below) we consider that the CAA's views and justifications in relation to embedded debt are appropriate.

If the CAA were to adopt our recommended approach to estimating the RPI-CPI wedge then the cost of embedded debt would as a result reduce by around 10 – 20 bps. However, were the CAA to retain their approach to inflation, then the CAA's proposals for the cost and proportion of embedded debt would remain as presented in the draft NPP.

9.1.7. Cost of new debt

The CAA have proposed a real cost of new debt of 0.1% within a range of -0.4% to 0.5%. This equates to a nominal cost of new debt of 3.1%. In addition, the CAA have proposed a transaction cost allowance of 0.1%.

The justification offered by the CAA is that a nominal cost of new debt of 3.1% is reflective of the mid-point of the estimates from Europe Economics, once the CAA makes further adjustments for liquidity and inflation risk and for the notice period premium. In addition, the CAA comment that the proposed cost of new debt is close to NERA's estimate for the cost of new debt if the estimated notice period premium of 0.5% is removed. Removing this premium would reduce NERA's estimate from 3.64% to 3.14%. In relation to the transaction cost allowance, the justification put forward by the CAA for reducing the allowance from 0.15% at RP2 to 0.1% is that 0.1% is between the estimates from NERA of 0.15% and from Europe Economics of 0.07% and is consistent with the CAA's review of recent regulatory precedent.

Our views about the CAA's justification are that the amendments for liquidity and inflation risk are well-founded. In relation to the notice period premium, we welcome the CAA's comments that there is strong protection in the UK RAB-based regulatory framework that should provide reasonable protection for debt holders under a rolling licence period. In this context we accept the CAA's approach to not including the premium in the cost of debt estimate.

However, we do not agree with the assumption made by Europe Economics, and by implication the CAA, that 10 years should be the benchmark timescale for new bonds issued by NERL. We consider this to be inconsistent with the timescale of the assets that this debt is funding. It would be more logical to assume that the timescale for new bonds more closely matches the 15 year period that is used by the CAA for regulatory depreciation. In addition, this approach would better reflect the regulatory precedent from RP2 where the cost of new debt was set at the upper end of the range provided by PwC which itself was based on the yields of 10 – 15 year bonds.

The consequences of the CAA proposals are that by assuming a 10 year maturity for new debt, the cost of new debt is understated by around 0.3%, equivalent to £1.5m (in 2017 prices) per annum. This is calculated by reinstating NERA's maturity adjustment (+0.38%) in the bottom-up approach to estimating the cost of new debt and by removing the Europe Economics maturity adjustment of 0.20% to the 10+iBoxx series in the top-down approach. As the CAA are using the mid-point of these two approaches, the net adjustment would be around 0.3%.

On transaction costs, we consider that the CAA does not put forward clear evidence for the allowance being changed from RP2.

To address our concerns, the CAA could:

- › Align the assumed maturity of new debt with that of the period of regulatory depreciation.
- › Maintain the transaction cost assumption at the RP2 level of 0.15%.

This, along with the adjustment to the cost of embedded debt, would result in a cost of debt assumption of 1.07%, near the upper bound of the CAA's proposed range.

9.1.8. Tax uplift

The CAA have proposed a tax uplift of 11.7%.

The justification offered by the CAA for this calculation is that it has been made by applying the CAA's draft proposals to the financial model provided by NERL.

Our view is that this calculation has been applied correctly, but will need to be amended again to reflect any proposed changes to these draft proposals.

The consequences of the CAA proposals are that NERL recover the expected future tax charges associated with these draft proposals, in an appropriate manner. However the calculation of the tax uplift will need to be updated again upon completion of the CAP1758 consultation.

9.2. NERL's Regulatory Asset Base

The CAA have retained RPI indexation of NERL's RAB for the draft performance plan and will consider whether a move to CPI (or CPIH) is appropriate for RP4.

The justification offered by the CAA is that the limited availability of CPI or CPIH-linked bonds in the current market means that a switch to CPI indexation could increase financing risks and lead to higher costs to customers.

We agree with the CAA's justification and with their proposed approach to indexation of the RAB.

The consequences of the CAA proposals are that the current approach taken for RP2 is retained for RP3.

We support the CAA's approach and do not propose any changes.

9.3. Regulatory depreciation

The CAA have proposed maintaining the asset life assumptions used in NERL's RP3 Business Plan to determine a regulatory depreciation profile for the NPP. The only adjustment proposed by the CAA to the regulatory depreciation in NERL's RP3 Business Plan arises from applying lower allowances for capital expenditure (see Chapter 5) and lower assumptions for the RPI-CPI wedge (see below).

The justification offered by the CAA for not making further adjustments to regulatory depreciation in NERL's RP3 Business Plan was that Grant Thornton, who were engaged by the CAA to review NERL's financial model, did not identify any issues with the calculation of regulatory depreciation in their review.

We agree with the CAA's justification for not amending the profile of regulatory depreciation. However, we disagree with the lower RPI-CPI wedge assumptions used by the CAA (see below).

The consequences of the CAA proposals are that if the inflation forecasts of Oxford Economics turn out to be accurate, then NERL's regulatory depreciation will be understated by around £7m (in 2017 prices).

We support the CAA's assumptions for regulatory depreciation. However, we propose that the CAA should assume a RPI-CPI wedge in line with the recommendation below.

9.4. Inflation

The CAA have proposed to set their forecast for RPI over RP3 at between 1% p.a. and 1.3% p.a. above their forecast for CPI (i.e. a RPI-CPI wedge of between 1% p.a. and 1.3% p.a.).

The justification offered by the CAA is that for the first three years of RP3 it is appropriate to base the RPI-CPI wedge on HM Treasury's average of independent forecasts and for the final two years of RP3 to base the RPI-CPI wedge on the long-term estimate provided by the Office for Budget Responsibility (OBR) of 1% p.a.

Our view is that the CAA's approach to estimating the RPI-CPI wedge in the first three years of RP3 is reasonable, given that HM Treasury's projections use an average of independent forecasts. However, we do not consider it is reasonable simply to use the OBR estimate of 1% p.a. for the remaining two years, when this is only one data point and Oxford Economics forecasts an RPI/CPI wedge for the last two years of RP3 of around 1.6% per annum.

The consequences of the CAA proposals are that there is a heightened risk that for the RP3 period the RPI-CPI wedge is underestimated and that NERL's revenues could be reduced in real terms by around £7m (in 2017 prices), largely within regulatory depreciation, if the actual RPI-CPI wedge is in line with projections from Oxford Economics.

To address our concerns, the CAA could:

- › Use a higher value for the RPI-CPI wedge, in the last two years of RP3. For example the mid-point of the OBR estimate and Oxford Economics forecasts (i.e. 1.3% per annum).

9.5. Financeability

The CAA have concluded that their draft proposals are financeable and consistent with NERL retaining access to cost effective investment grade debt finance to support its investment programme. As such, the CAA do not consider it necessary to re-profile regulatory depreciation to deal with issues of financeability or affordability.

The justification provided by the CAA is that they assessed financeability using similar credit metrics to those considered by NERL and examined two stress tests designed to reflect plausible downside scenarios.

The CAA consider that although the equity return associated with the two stress tests is close to zero or negative, actual returns could be improved through effective management of costs and performance against financial incentives.

In relation to the impact that the stress tests have on the expected return for shareholders, the CAA do however note the relatively high sensitivity of the return on regulated equity (RORE) to the changes in regulatory returns from lower traffic and higher costs, given the relatively small size of NERL's RAB to operating expenditure, compared with other regulated companies.

The RP3 NPP would lead to an expectation of negative equity returns unless determined costs are increased

The draft NPP assumes that in RP3 NERL will deliver high quality service along with all the airspace and technology programmes (with the exception of TC Foursight) that we assumed in our RP3 Business Plan, but with far lower determined costs. However, the CAA's financeability analysis does not take into account the following factors:

- › Service and environmental penalties of around £5.4m p.a. due to targets being set at unattainable levels (C2-no transition allowances; 3Di set at the wrong level and without exclusions for factors outside our control)
- › The full cost of the resources required to deliver the NPP outcomes as set out in our RP3 Business Plan. The NPP objectives could only be delivered if the shortfall in the full cost of the resources (£14.2m p.a.) is borne by shareholders.
- › The unattainable increase (£9.8m p.a.) in the contribution of non-regulatory income to the single till assumed by the CAA which cannot be offset by corresponding cost reductions while at the same time delivering the NPP outcomes.
- › The high risk (£14.1m p.a.) to the full recovery of NERL's determined costs created by the CAA's choice of STATFOR's traffic forecast compared to NERL's more accurate traffic forecast.
- › Stranded costs (£2.5m p.a.) arising from the delay in the deployment of TC Foursight to later in RP4 as a consequence of the CAA reducing the allowable costs of NERL's capex programme by £48m.

Assuming that the NPP outcomes need to be delivered, then the chart below shows the costs and risks that shareholders would be required to bear. These would result in negative expected average returns to equity in RP3 at around -£16.2m p.a. (in 2017 prices), after making adjustments for lower expected tax payments.

Figure 1: NERL's expected equity return in RP3 under CAA proposals (£m, 2017 prices)

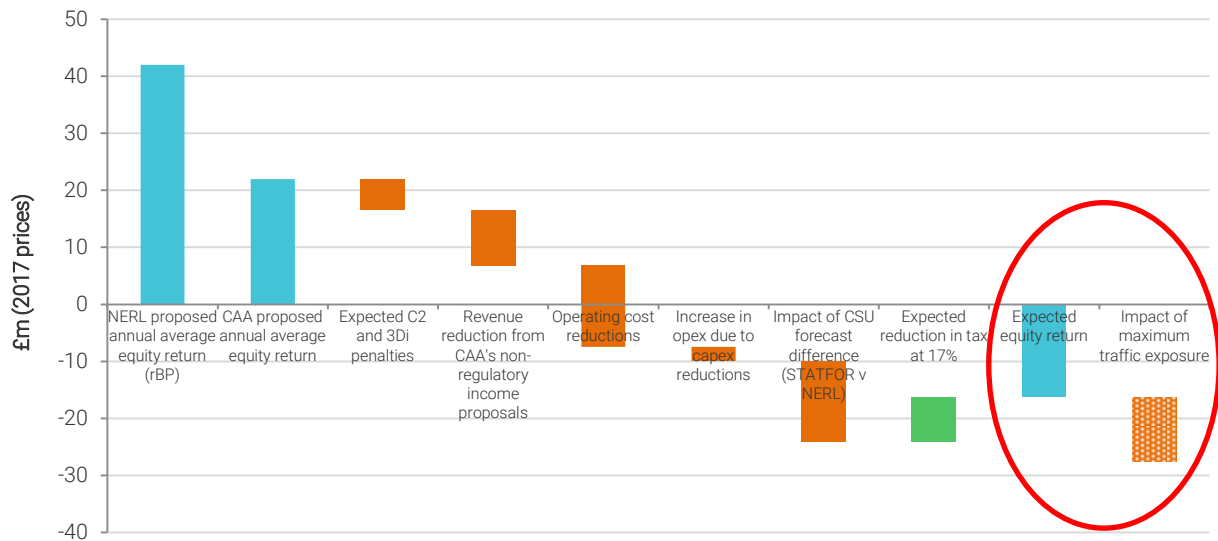


Table 5: NERL's credit metrics in RP3 under CAA proposals

			CAA proposals in draft NPP				
Assessment of credit metrics			2020	2021	2022	2023	2024
Adj. Net Debt to RAB	Unit	Threshold/trigger	2020	2021	2022	2023	2024
Adj. Net Debt to RAB	%	<70%	46%	56%	60%	60%	61%
Adj. FFO to Net Debt	%	>18%	46%	39%	24%	22%	23%
Adj. FFO Net Interest	ratio	Not in guidance	10.3x	10.1x	7.2x	6.7x	6.8x
Adj. Interest Cover	ratio	Not in guidance	1.8x	2.8x	1.6x	1.3x	1.2x

			NERL view on CAA proposals in draft NPP				
Assessment of credit metrics			2020	2021	2022	2023	2024
Adj. Net Debt to RAB	Unit	Threshold/trigger	2020	2021	2022	2023	2024
Adj. Net Debt to RAB	%	<70%	48%	58%	63%	65%	67%
Adj. FFO to Net Debt	%	>18%	41%	31%	17%	15%	16%
Adj. FFO Net Interest	ratio	Not in guidance	9.4x	8.3x	5.6x	5.1x	5.3x
Adj. Interest Cover	ratio	Not in guidance	1.0x	1.3x	0.1x	-0.2x	-0.1x

Taking these factors into consideration, we find that the CAA's draft proposals are unlikely to be consistent with NERL maintaining a solid investment grade credit rating. This is because the FFO to Net Debt ratio goes lower than 18% and, although not currently in Moody's guidance, we consider that having an adjusted interest cover of around zero is not consistent with a solid investment grade credit rating. In addition, the CAA's proposals do not result in a "fair return" for the risk exposure faced by providers of equity.

This is evident from the chart above which shows that the equity return is negative under the CAA's proposals even before stress testing. It is interesting to note that when we applied the CAA's proposed regulatory return to our pricing proposal for the extension of our *current* FMARS contract (to ensure fair treatment between the MoD and airlines), this resulted in a margin that we understand falls below the current statutory minimum allowed by the MoD for *new* qualifying defence contracts.

Delaying key RP3 NPP outcomes to meet proposed determined costs would lead to an expectation of equity returns below the cost of equity

As explained earlier, faced with the CAA's proposed determined cost allowance, we would be compelled to reprioritise our objectives for RP3 and delay by several years our technology and airspace programmes and reduce our planned costs in RP3 accordingly. As well as leading to deteriorating performance levels in future reference periods, there would still be an expectation of equity returns below the cost of equity.

This is because we would still not be able to fully mitigate the CAA's proposals for operating costs and non-regulatory income (e.g. redundancy costs are not included in the CAA's allowances). In addition, we would still face the high risk from the CAA's choice of traffic forecast and from service penalties due to lower resource levels.

To address our concerns, the CAA could:

- › Amend their draft proposals to ensure that it is not unduly difficult to finance our activities taking into account appropriate stress testing. This could be achieved by adopting the proposals contained in our response.

10. NERL's response to Chapter 8: London Approach

CAA question:

We would welcome stakeholder comments on our proposals around the scope and performance metrics for the London Approach service.

Our main areas of feedback on the draft NPP's London Approach proposals are as follows:

- › We support Biggin Hill airport being included in the charging scheme for the London Approach service:
 - › based on the existing scope of the services defined in the current contract between NSL and Biggin Hill airport
 - › if NERL is allowed to bill Biggin Hill airport directly to ensure we recover all of our charges.

10.1. Biggin Hill airport

The CAA have proposed that Biggin Hill airport will be included in the London Approach service for RP3. The CAA have justified their proposal with the following reasons:

- › The airport has requested to be added to the scope of these regulated charges
- › The service is operationally identical to London City airport using shared equipment and resources
- › There is no evidence of competitive distortion
- › There is no evidence of a significant administrative burden on NERL.

In our view, the service at Biggin Hill airport is not operationally identical to other London airports due to its location (outside controlled airspace) and its operating environment (with a significantly higher proportion of low weight aircraft including those that do not use NERL's services at all, such as flying clubs). These factors mean that the CAA have not taken sufficient account of the practical difficulties NERL would face in resourcing and providing a London Approach service beyond the existing scope. Also, there would be a significant administrative burden of recovering London Approach charges from operators at Biggin Hill airport compared to other airports currently within the London Approach service.

A significant proportion of aircraft based at Biggin Hill airport fly using visual flight rules (VFR) to navigate their aircraft and receive air navigation services from the airport itself. Only aircraft using instrument flight rules (IFR) receive a service from NSL. Under the existing contract with NSL, the airport receives an IFR approach service of up to 8 aircraft per hour between the operating hours of 06:30 to 22:30.

If Biggin Hill airport wish to receive the existing IFR approach service currently provided by NSL from NERL under the London Approach charging scheme, then we can do this provided the scope remains unchanged. Our RP3 Business Plan does not contain the resources needed to expand the existing scope. This would be practically difficult to do because capacity is already constrained within the London Approach area and all our training capacity is already directed at London Airspace modernisation including airspace changes for runway 3 at Heathrow airport.

In addition, almost 70% of all commercial flights at the airport would incur a charge of less than £10 per flight from NERL. This charge would not cover the cost to NERL of directly invoicing and managing these new accounts. The equivalent proportion for London City is 2%. For these reasons, in order to recover all of our London Approach charges for Biggin Hill airport, we would need to bill the airport directly. Biggin Hill airport would then need to recover these charges from its airspace users in a similar way that the airport recovers the direct charge it currently receives from NSL. This approach would avoid imposing a greater administrative burden on NERL than we have in relation to other airports using our London Approach service.

To address our concern, the CAA could:

- › Include Biggin Hill airport in the London Approach charging scheme based on the existing scope of the services defined in the current contract between NSL and Biggin Hill airport.
- › Allow NERL to bill Biggin Hill airport directly based on the number of commercial flights and applying the London Approach formula for calculating the charge.

10.2. Cost allocation

The CAA have proposed that cost allocation will be the same for London Approach in RP3 as RP2. The CAA have justified its approach largely through the practical difficulties associated with making a change. This seems a pragmatic way forward, depending on the views put forward by stakeholders to the CAA's consultation.

10.3. NERL reporting

The CAA have proposed that NERL engage with users during RP3 to identify and implement a suitable performance metric monitoring under Condition 11 (in addition to those under Project Oberon). The CAA justifies this through the importance of NERL providing a metric that accurately reflects its performance in this area (and which is relevant to users). NERL supports the CAA's proposal, which is consistent with the outcomes from CCWG and NERL proposals in RP3 Business Plan.

11. NERL response to Chapter 9: Uncertainty mechanisms

CAA question:

We welcome comments from stakeholders on the issues raised in this chapter and in particular whether our draft proposals create sufficient flexibility to allow for the efficient funding of airspace modernisation.

Our main areas of feedback on the draft NPP's uncertainty mechanisms proposals are as follows:

- > We need enough flexibility to respond to significant uncertainties in RP3, including Brexit and future developments and requirements (e.g. airspace modernisation, drones, cyber security).
- > The CAA's draft NPP proposals remove the flexibility of NERL's RP3 Business Plan, which is necessary for its coherence.
- > We accept an opex flexibility fund (OFF) of £7m pa but need the same scope and access as proposed in our RP3 Business Plan.
- > Appropriate governance arrangements have to be put in place for the SIP to ensure that this funding is accessible (as well as subject to appropriate scrutiny).
- > ACOG costs (£15m) should be added into the core plan (noting that the DfT and the CAA have commissioned NERL to perform the ACOG role) – see section 7.

We set out below our response to the CAA's questions on uncertainty mechanisms.

11.1. EU mechanisms

The CAA have proposed that NERL uses the default mechanism in SES legislation for dealing with actual traffic different to the forecast, which is the same as in place for RP2. They also propose that NERL will be able to pass through costs in specific areas due to unforeseen changes, such as in investment, pension and law.

These EU mechanisms reduce NERL's systematic risk compared to the alternative of having none in place, and reduce user charges and improve NERL's financeability. In particular, using the RP2 default will ensure that there will be no increase in risk or NERL's cost of capital compared to now, where airlines were clear that they did not want any cost of capital increase.

NERL supports the CAA's approach of adopting the default, which matches that used in RP2 approach and prevents an increase in the cost of capital compared to now, which neither we nor airlines want.

11.2. Capex contingency fund

The CAA have proposed that there would be a capex contingency fund for the purposes of wider requirements, such as airspace modernisation and electronic conspicuity. Under the CAA's proposed enhanced SIP mechanisms, the Independent Reviewer would assess whether NERL had incurred those costs efficiently and there would be an escalation process to, ultimately, the CAA and DfT.

The CAA justify this proposal based on its support of the delivery of national strategic objectives.

NERL requires a small contingency fund (<5%) to provide flexibility to risks and emerging requirements in its core strategic investment programme. The level of provision is not high and previous experience suggests that this contingency is likely to be required. It ensures that customers are not asked to fund unknown risks and requirements ahead of time on the basis that variations both up or down in total capex can be addressed through the true up mechanism. This flexibility reduces the costs and prices faced by customers. The alternative would be for NERL to look for savings elsewhere in the programme to ensure some contingency provision remained available to deal with risks and unknowns.

As indicated earlier, we will need to prioritise investments which address safety and resilience and those which replace end of life systems, leaving other programmes including airspace change most at risk. The proposed focus of the capex contingency fund on the wider plan requirements, instead of NERL's SIP, would mean that we would have to develop our own internal contingency fund for capex, by de-scoping the investment portfolio. The resulting delay to technical programmes, and airspace changes which these programmes enable, would mean that customers would not receive in RP3 the full scope that they require.

The capex contingency fund was not intended to fund wider requirements related to, for example, electronic conspicuity, which are separate and could be large in their own right compared to the <5% proposed.

To address our concerns, the CAA could:

- › Ensure the capex contingency fund is focused on NERL's core strategic investment plan.

11.3. Opex flexibility fund

The CAA have proposed £35 million in RP3 would be focused on the delivery of the Airspace Modernisation Strategy (AMS) and governed through the enhanced Service and Investment Plan (SIP) for RP3 with links to appropriate AMS bodies instead of NERL's current internal Investment Board. In particular, agreement would be needed from the CAA's Airspace Modernisation DMO team for using the fund, with the DfT having the key decision-making role. Subsequent conversations with the CAA have indicated that the role of the OFF could be broader than AMS, covering drones, electronic conspicuity and even some aspects of Brexit.

The CAA justify the focus being the airspace modernisation strategy (and potentially other elements of the wider plan) because it believes it has already made an allowance for operating costs that would allow NERL to meet its obligations and provide its services.

The CAA have failed to provide sufficient evidence for why their allowance for operating costs allows us to meet our obligations and provide our services (and hence why no operational contingency money is required). In addition, the £7m p.a. is unlikely to be enough to cover the full scope of uncertainty associated with AMS, drones, electronic conspicuity and aspects of Brexit.

In relation to electronic conspicuity in uncontrolled airspace, we are aware that the CAA are seeking our support on the 'Airspace Integration' programme, which includes the introduction of electronic conspicuity in uncontrolled airspace. We consider that it would be inappropriate to finance these activities through the OFF, which will be funded through commercial airline charges. Therefore, we will need to discuss an mechanism (including funding) with the CAA.

The CAA have failed to take into account the agreement reached between NERL and airlines about the broad use of this fund by NERL that was agreed through consultation in summer 2018. This broad use would mean that the right governance arrangements would need to be put in place, which might involve the new ACOG body as a delivery agent for the CAA and DfT where the objective of the spend is related to AMS. Customers have supported proposed governance arrangements for the OFF which were discussed through the consultation and during the meeting on SIP 19 (Deep Dive). Our proposal for the opex flexibility fund was that it should be available to allow for a switch between capex and opex solutions if this would minimise cost overall, as well as being available to address risk and uncertainties that might arise in the delivery of our core plan. The potential for switching will be important because of the greater use of service type agreements in delivering and implementing new technology.

If this money was restricted to airspace modernisation activities, it would limit NERL's ability to respond to external changes in conditions and restrict our ability to deliver other customer objectives in the most efficient manner. The lack of contingency budget means that NERL would have to develop its own internal contingency fund for opex which would leave less money available for the core plan. As with capex, we would need to prioritise available resources towards safety and service which would mean that it will become more challenging to release resources to support the change programmes, with potential knock on impact on both the DSESAR and airspace programmes.

In relation to projects funded through the RP2 FAS Facilitation Fund, the FAS Deployment Steering Group is proposing a three month grace period after the end of RP2 for invoicing and approving the costs of relevant projects. We will discuss with the CAA how this pragmatic approach to dealing with the end of the Reference Period will work in practice.

To address our concerns, the CAA could:

- › Ensure the NERL has a broad ability to use the OFF, as outlined in our RP3 Business Plan and as agreed with customers during the consultation in summer 2018.

11.4. AMS support fund

The CAA have proposed a £10m support fund over RP3 with an explicit focus on airspace modernisation, which would be funded through the CAA's Determined Costs.

The CAA justify this fund because it would be focused on projects important to the success of AMS and where there are no other appropriate mechanisms for the recovery of these costs. Its governance and decision-making arrangements have yet to be defined and consulted on but will be linked with the overall AMS governance arrangements.

NERL supports initiatives that will help to deliver the AMS, especially where these projects would otherwise not happen because they are unfunded. It will be important that the governance arrangements ensure the CAA are not conflicted in their role of a delivery body drawing on this money and in their role as a regulator monitoring progress against targets.

To address our concerns, the CAA could:

- › Ensure appropriate governance mechanisms are put in place, especially in relation to the CAA as a delivery body and decision-maker.

11.5. Price-control reopeners

The CAA have proposed that a price control would be reopened only under exceptional circumstances, whether under SES or TA00 legislation. The CAA justify this restriction to ensure that the efficiency incentives of economic regulation remain strong.

The CAA have failed to take account of relevant considerations to ensure that there are appropriate adjustment mechanisms in place for the high degree of uncertainty faced by NERL in RP3 (e.g. asymmetric Brexit risks).

The “exceptional circumstances” requirement will restrict NERL’s abilities to meet our customers’ demands (e.g. drones and/or electronic conspicuity). In addition, NERL will bear additional risks compared to the RP3 Business Plan, such as Brexit, which will need to be factored into the cost of capital.

To address our concerns, the CAA could:

- › Confirm that price reopeners are appropriate in a broader range of circumstances to include, for example, uncertainties that are known about now such as Brexit, electronic conspicuity and drones.

12. NERL response to Chapter 10: Terminal navigation services

CAA question:

We welcome comments from stakeholders on the issues raised in this chapter including our proposal to retain London City in the scope of the performance scheme for the purposes of TANS and our proposed TANS capacity target.

NATS (Services) Ltd is providing a separate response to this question.

13. NERL's response to Chapter 11: Oceanic

CAA question:

We welcome stakeholders' views on any of the issues discussed in this chapter. In particular, stakeholders are encouraged to comment on:

- › *the approach to determining the building blocks and the proposed values of those building blocks;*
- › *the decision to reject NERL's proposal of a pass-through approach ADS-B data costs to users;*
- › *the proposed governance and performance monitoring arrangements regarding the costs and benefits of ADS-B; and*
- › *whether the oceanic price control should have a traffic risk sharing mechanism and whether oceanic charges should be profiled or not.*

We set out below our response to the CAA's questions on the en route (oceanic) area activities that will form the basis of the CAA's price controls for RP3 and on the potential revisions to NERL's licence to accommodate the creation of two charging zones (Tango and North Atlantic).

13.1. CAA's proposals for oceanic

We welcome the CAA's support for implementation of ADS-B from January 2020, which will improve safety, capacity and efficiency (fuel saving benefits) over the Ocean. We agree with the CAA's conclusion that even taking a conservative view of assumptions, this is likely to result in net benefits for users. We also accept CAA's proposals in relation to capital expenditure if we are given assurance that via the SIP process we will be able to have the opportunity to consult customers and the CAA on new projects in RP3.

However, the CAA have proposed a number of very material changes to the oceanic price control. These are highly likely to render this business loss making and therefore financially unviable. Also, these proposals create significant risks and provide a disincentive for NERL investing in satellite ADS-B services.

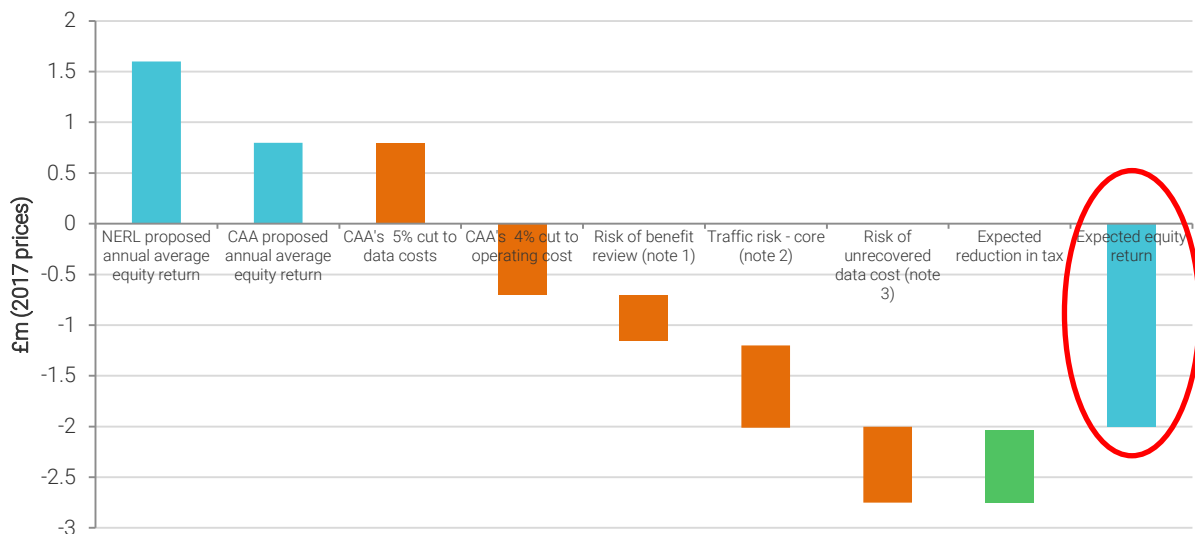
The CAA proposes an equity return for oceanic of £800k p.a. (2017 prices) on revenues of around £42m p.a., representing an extremely low margin of below 2% p.a. This margin could be converted into a loss, or could be materially eroded, from any one or a combination of the following:

- › The CAA's proposed reductions in data charges (5%) and operating costs (4%) totalling £1.5m p.a. which are unrealisable or would undermine the resilience and predictability of the service which acts as a gateway to the even larger UK en route service

- › Exposure to loss of data revenues resulting from the CAA's review in 2022 of the benefits case for satellite ADS-B. A 5% reduction would eliminate most of the equity return.
- › A 3% reduction in core revenues (excluding data) from lower traffic absent any traffic risk sharing. Oceanic traffic volumes have deviated from CAA forecasts by 3% or more in 11 of the last 14 years.
- › A 5% under recovery of data costs if the recovery mechanism does not guarantee recovery of these costs at no margin

The chart below shows how these risks would affect the oceanic equity return for RP3.

Figure 2: Expected oceanic equity return in RP3 under CAA proposals (£m, 2017 prices)¹¹



The oceanic service could be made financially viable and able to deliver the improvements in safety, service and fuel efficiency if the CAA adopts the following proposals.

- › Allow the full cost of data for the satellite ADS-B service. The CAA's proposed reduction (5%) is not realisable from the provider, Aireon. An independent consultancy, Euroconsult, has studied Aireon's global charges and found these to be fair and commensurate with the level of risk faced by the company. In addition, CAA should allow the full operating costs contained in our plan for reasons set out below.
- › Reconsider and withdraw the NPP proposal for a review of benefits of the use of satellite ADS-B in 2022. The CAA's own cost benefit analysis shows a strong net benefits case using conservative assumptions (fuel costs 60% lower than currently). Even if some of these benefits were not to be realised in full, there would still be significant benefits remaining not least of which would be safety. It is not appropriate, and contrary to good regulatory practice, for NERL to face potential losses for investing in a strong business case. If the CAA insists on this review, it should either be carried out as part of the RP4 regulatory review when its focus should be on objectively measuring progress in delivering the benefits

¹¹ Note 1 - the benefit review in 2022 could reduce revenues. Modelling above reflects a 5% reduction, affecting 3 years of RP3. The risk could be much more than this.

Note 2 - the impact of a 3% reduction in traffic volume - without risk sharing - applied to core costs only. The traffic variance could be significantly more than this.

Note 3 - the partial under recovery of the data cost allowance if NERL is exposed to risks (e.g. traffic) that cannot be mitigated. A 5% loss is modelled above.

case, particularly safety, and on how further improvements could be delivered for customers.

- › Introduce the same traffic volume risk sharing mechanism for core oceanic revenues as exists for the UK en route service. This would align risks and returns in a better way.
- › Assure NERL of recovering the data charges (with no margin) without exposing NERL and its customers to the risk of under or over recovery. In addition, adjustments to the price control should be made up to the time that the NPP is finalised to reflect any changes in traffic forecast and exchange rates which could have a material impact on the oceanic return.

13.2. Implications for cost of capital for the oceanic service

We would expect the cost of capital to fairly reflect the risks faced by the oceanic service. If the CAA adopts all our proposals then these risks will reduce. However, if not all of our proposals are adopted then the risks will increase. We have indicated below how the cost of capital could vary accordingly.

- › If the CAA accepts all of our proposals, then we would expect the same cost of capital for the oceanic service as for UK en route. See our response to Chapter 7.
- › If the CAA were to accept all of our proposals, but without the introduction of traffic volume risk sharing for core revenues then the asset beta component of the cost of capital would need to be increased to around 0.71 based on advice from NERA that it should be similar to the average asset beta of international airports that face full demand risks. Logically this is higher than ENAV's asset beta since ENAV benefits from traffic volume risk sharing. This would result in a vanilla (post tax) real cost of capital for the oceanic service of at least 5.3%, compared to an equivalent vanilla (post tax) real cost of capital for the en route service of 4.14%.
- › If the CAA were to accept a mix of different proposals then the cost of capital will need to be adjusted accordingly. We would expect a material increase in cost of capital if the CAA sought to retain the benefits review in 2022 with the potential for ex post reductions in NERL's revenue. We would need to consider whether such an increase compensated us fairly for the risks. Also, we would need to consider the impact of any such findings from a review in 2022 on the service.

13.3. Building blocks

Traffic

The CAA have proposed to adopt our traffic forecast for the price control building block for the oceanic service. The CAA's justification is that NERL's traffic forecasts are based on a more established methodology than the alternatives of the North Atlantic Economic Financial and Forecast Group (NATS EFFG) and a more detailed methodology than STATFOR's.

We welcome the use of our traffic forecast for RP3. We ask the CAA to note that we have provided an updated forecast (December 2018) and that we will provide another forecast in May 2019, if there is a material difference. Our December 2018 forecast projects an increase in traffic compared to our forecast in August 2018. This means that there will be an increase in the cost of satellite data that we will pay Aireon and that we will need to recover from our customers.

Benefits case

The CAA have conducted a simplified cost-benefit analysis (CBA). This differs from our analysis as the CAA considers only the NERL Shanwick portion of airspace (we considered Gander and Shanwick combined), includes £15m of capital expenditure to implement ADS-B (not included in our assessment), uses a fuel price that is 60% lower than our assumption, and assumes that fuel uplift benefits will only come into effect in 2021 (rather than in 2020). The CAA also estimates the value of safety benefits of introducing ADS-B and references the ICAO business case as further evidence that the case for investment is positive.

The CAA justifies the use of a lower fuel price to provide a stress test of benefits. Their CBA assumes a one year delay to fuel uplift benefits to reflect user feedback that airlines would not realise these savings until a year's worth of evidence has been received. The CAA includes capital expenditure as this is necessary to enable ADS-B benefits.

We welcome the CAA's conclusion that when taken together safety and efficiency benefits indicates that there would be advantages to users in developing ADS-B and that the ADS-B proposal even taking a conservative view, is likely to result in net benefits for users.

We note that this CBA is very conservative given that it assumes fuel costs 60% lower than the level assumed by NERL. The case also includes 100% of NERL's proposed satellite data cost, and 100% of our RP3 capital expenditure projections. It should be noted that around 50% of the £15m capital expenditure would need to be incurred to sustain the existing oceanic service if we did not invest in ADS-B technology. Therefore the CBA should only consider incremental capital costs (£7.5m over RP3).

We also note that there are two minor errors in the CAA model which, if corrected, would lead to a net benefit of £51.4m over RP3 rather than £52.1m over RP3 calculated by the CAA. This is equivalent to around a 1% difference overall. The first error is that all costs and benefits are calculated using all oceanic flights (including Tango). This error overstates the net benefits by around 10%. The second error is that the capex (depreciation) cost is incorrectly grossed up by a factor of 1,000,000 / number of oceanic flights, which has the effect of more or less doubling the value of the depreciation cost.

In relation to the ICAO study, it should be noted that this included ADS-B costs and benefits for all NAT airspaces, including those where flight density is likely to yield marginal or zero benefits. This distorts the overall cost/benefit argument when in comparison, higher flight efficiency benefits are typically yielded in more densely populated airspace. In the case of NERL controlled oceanic airspace, NERL operates the busiest portion of NAT airspace and hence our benefits are likely to be higher than the ICAO average.

Determined Costs

The CAA have proposed the following:

- › **Operating costs:** The CAA have applied the same efficiency assumption of 2.3% p.a. for staff costs from 2019 in oceanic and UKATS, the justification or evidence being that these are "similar" to the rate that has been applied to NERL's en route price control. The CAA have applied a 5% reduction to oceanic non staff costs compared to our plan based on an assertion that there is the potential for efficiency gains relating to capital investment, but again without offering any evidence.

- › **Data costs:** The CAA proposes to reduce the allowance for ADS-B data by 5% because of "...the uncertainty associated with the lack of benchmarking information from NERL to properly justify the prices in its contract with Aireon." The CAA also state that "NERL has said that its contract with the provider of the ADS-B service, Aireon, would entail the payment of a fixed annual sum".
- › **Capital expenditure:** The CAA proposes to reduce the allowance for oceanic capex by 5% because there was "limited justification in NERL's RP3 Business Plan for its oceanic capital programme".

NERL's view on the CAA's justification:

- › **Operating costs:** The NPP appears to disregard the outcome from customer consultation in which the co-chair report stated that airlines and NERL were in agreement regarding the level of the core oceanic price for RP3 (£51.61 in 2017 prices). Oceanic operating cost movements between RP2 and RP3, relating almost entirely to an increase in operational ATCOs, was fully justified in our RP3 Business Plan and explained to customers during oceanic consultation workshops.

The Steer report did not highlight any oceanic specific cost savings.

In the NPP, the CAA noted that we outperformed our RP2 targets. This relatively small cost saving (around 3%) was due to difficulties that we faced in recruiting and training oceanic ATCOs to handle traffic increases we experienced in RP2. We are now planning to increase college output to meet demand in early RP3. It would not be appropriate for the CAA to base a decision to reduce oceanic operating costs for RP3 on the small savings in RP2 operating costs, caused by ATCO shortages. We do not plan for this staffing shortfall to be repeated.

- › **Data costs:** NERL is making no margin on satellite data charges. It is irrational for the CAA to assume that NERL would subsidise airlines by receiving a revenue allowance that was 5% lower than the costs incurred. The satellite data cost requirement is based on Aireon's global pricing tariff of \$40 per flight hour which transparently sets out prices which ANSPs will pay worldwide.

NERL commissioned an independent report in order to verify that Aireon was not pricing in a way that led to excessive returns being generated by the supplier. The CAA proposal appears to ignore or disregard the evidence presented by this study (conducted by Euroconsult). The study concluded that the level of Aireon's potential financial return was fair and commensurate with the level of risk faced by the company. As described in our RP3 Business Plan, we also held a workshop with customers during summer 2018 to discuss this matter. This meeting was attended by the CAA. During the meeting, customers confirmed that they understood the approach taken by Euroconsult and that they were content that the report had been independently produced.

The data costs in our plan are fully aligned to the Aireon global pricing tariff, reviewed by Euroconsult, comprising a charge of \$40 per flight hour starting in 2020 and rising with inflation, converted at a rate of £1 = \$1.30 and multiplied by the flight hours contained within our North Atlantic oceanic traffic volume forecast. We believe this is an accurate projection of the total cost we will pay if our traffic forecast is fulfilled.

As described above, the business case for ADS-B (both NERL's and the CAA's) shows positive benefits with the full data cost. For this reason it is illogical for the CAA to reach the conclusion that we should not be allowed to recover the full data cost that we will pay to our supplier.

Although agreement was reached in principle with Aireon to consider the payment of a fixed annual fee rather than a variable (per flight hour) charge, this was on the clear assumption that NERL would have a full pass through arrangement for data costs. Without a pass through mechanism, it would not be appropriate for us to agree a contract with Aireon which includes a fixed annual sum. We provide more detail on this matter in the section below.

- › **Capital expenditure:** The CAA statement that there was limited justification for oceanic capital expenditure is incorrect. NERL's RP3 Business Plan (Appendix M, page 132) provided a table that set out the investments and associated benefits. The level of detail provided is completely reasonable given the time horizons involved and the complexity of the subject matter.

The consequences of the CAA's proposals:

- › **Operating costs:** The CAA's operating cost reduction represents around a 4% reduction in operating costs (excluding pensions), relative to our RP3 Business Plan. As around half of the oceanic operating cost base relates to mainly fixed infrastructure and engineering costs (many of which are shared with en route), the majority of the CAA's proposed oceanic cost reductions can only be realised by making reductions in the direct costs of our oceanic operation. This would be equivalent to a 12%-13% reduction in the numbers of ATCOs relative to our plan, effectively removing the additional controllers that we included in our plan, and which was accepted by customers.

In the context of 11% projected traffic growth over the RP3 period, a 12%-13% reduction in RP3 controller numbers, relative to our plan, will significantly reduce service resilience and undermine our planned service improvements. It will threaten the deliverability of the oceanic capital programme and reduce the fuel and service predictability benefits that airlines will receive. We will be unable to achieve the consistency of clearance quality set out in our plan (i.e. estimated at 90% requested trajectory; 80% variable speed allocation and associated fuel uplift benefits). This will reduce the level of fuel saving for airlines. Lower operational staffing will also diminish our ability to flexibly provide capacity in the South East Corner where we routinely see demand levels spike by up to 300% when neighbouring airspace services are interrupted. This would have a detrimental impact on airline operations.

- › **Data costs:** The 5% reduction of ADS-B data charges is equivalent to around £0.75m p.a. in 2017 prices. As described above, this is extremely material in the context of NERL's oceanic service. If NERL had to find operating cost savings to offset the impact of unrecovered data charges, in order to avoid making losses, this would further require reductions in controllable operating costs of a similar magnitude to those described in the paragraph above, with significant operational performance implications.
- › **Capital expenditure:** A 5% reduction in capital expenditure could put at risk the achievement of the benefits expected from ADS-B services, if this was viewed as a permanent reduction in cost.

To address our concerns, the CAA could:

- › Allow operating costs for the oceanic service in line with our RP3 Business Plan.
- › Set prices in RP3 at a level that enables us to recover the full projected data charge without the 5% reduction.
- › Provide assurance that we would be able to recover capital expenditure which was in excess of the allowance made by the CAA, through the capex pass through mechanism, subject to customer consultation via the SIP process.

Pass through proposals for data costs

The CAA notes in paragraph 11.28 that NERL proposes a pass through mechanism to ensure data costs are recovered in full if traffic is higher or lower than assumed. In this section, the CAA makes no comment on accepting or rejecting this proposal. In 11.66, the CAA asks for feedback on “the decision to reject NERL’s proposal of a pass through approach for ADS-B data costs to users”. Our assumption is that, based on these two paragraphs together, the CAA are rejecting a pass through arrangement.

The CAA does not offer any evidence to support their proposed rejection of a pass through approach for ADS-B data costs to users.

In our RP3 Business Plan we set out the rationale for why a pass through approach for data costs is appropriate. This was to avoid a situation where customers could materially overpay for satellite data (if traffic was higher than forecast) or NERL could under recover costs (if traffic was lower than forecast), if we were to agree a fixed annual fee with Aireon for the satellite data. This is in the context of NERL earning no margin on the data costs.

If the CAA are not willing to accept a pass through approach for ADS-B data costs, we will revert to a variable charge (based on \$40 per flight hour from 2020 plus inflation) in our contract with the supplier, Aireon, rather than agreeing a fixed annual fee.

By agreeing a variable charge per flight hour, the total cost we will pay Aireon for satellite data will increase or reduce each year depending on actual traffic levels. This would allow us to charge airlines a fixed fee per flight, for satellite data, which remains unchanged in real terms throughout RP3 and does not require a pass through mechanism. The total revenue we will recover from airlines will depend on the level of traffic that materialises (i.e. the fixed fee multiplied by number of flights). This will effectively match the total costs we will pay to Aireon.

It will be necessary for the CAA to allow NERL the full \$40 per flight hour cost (from 2020 plus inflation) if we are to revert to a variable charge without a pass through mechanism. This is because Aireon apply a uniform global pricing tariff per flight hour according to the density of the airspace in which each ANSP operates. This standard rate is set worldwide.

If a pass through mechanism for data costs is not in place, we will also require assurance from the CAA that oceanic revenue allowances for data costs would be adjusted as necessary during the period between April 2019 and until the NPP is finalised. This is to reflect changes in traffic forecasts and movements in £ / \$ exchange rates, thereby avoiding potential gains and losses in this respect.

Proposed governance and performance monitoring arrangements

The CAA have proposed:

- › **NATS Board certification:** a requirement that NATS Board will certify that a fully ADS-B based service is operational for its oceanic service before NERL can recover the associated costs.
- › **Service delivery reporting:** extra Condition 11 reporting for the oceanic service.
- › **Ex post CBA:** after two years, NERL will need to demonstrate that benefits of the ADS-B service exceed costs and that the service is supported by users. This demonstration is necessary to prevent re-opening of price control and a potential reduction of costs that NERL can recover through the oceanic charge (so that it is proportionate to the benefits to system users).

The CAA justifies its proposals in the following ways:

- › **NATS Board certification:** this is a safeguard against NATS sitting on “both sides of the transaction” in terms of NERL providing the ADS-B coverage and NSL having an ownership stake.
- › **Service delivery reporting:** this is so that users understand the benefits of service improvements from ADS-B.
- › **Ex post CBA:** this is to ensure that the benefits of ADS-B are greater than costs and user support is secured.

With the further clarification we have received from the CAA, we are content to provide the certificate referred to in 11.36.

We are also content to provide reporting of the costs and benefits as outlined in paragraph 11.37.

However, we do not agree that a post investment case appraisal should be carried out in 2022. The decision point to proceed with satellite based ADS-B services is now. This decision should be based on our own (and the CAA's) strong business case and that deployment of satellite ADS-B will fulfil the current ICAO NAT region service delivery road map as agreed at the state-level meeting of the region (SPG) which also agreed the CBA. We will be obliged to make payments for satellite data to the supplier, Aireon, for the whole reference period, and will make no margin on this data. It is unreasonable for the CAA to potentially reduce the level of revenues for data costs mid-way through the reference period.

As described in our summary response to the CAA's proposals, the benefits review proposed by the CAA represents a very significant risk to the viability of the oceanic service. This is because data costs of around £15m p.a. are nearly *twenty* times higher than the equity component of the return allowance for the oceanic service, and we will be committed to making satellite data payments to the supplier for the whole of the RP3 period, earning no margin on this cost. The CAA proposal does not make any adjustment to the cost of capital for the risks this represents.

The requirement to gain 'user support' could mean that although there was a positive business case, this would not be objectively measured, leading to NERL being unfairly penalised. In addition, it would be inappropriate to assume that NERL would be able to deliver the same level of benefits if the CAA were to remove funding for operating costs which are essential to the successful delivery of these benefits.

By conducting the business case appraisal in 2022, rather than at the end of the reference period, the CAA risks ignoring some of the key benefits (including user preferred routes) which will not be realised in full until later in RP3. This could lead to incorrect conclusions being drawn regarding the cost vs benefit relationship.

To address our concerns, the CAA could:

- › Remove the need for a benefits review in 2022.

If the CAA insists on this review, it should either be carried out as part of the RP4 regulatory review when its focus should be on objectively measuring progress in delivering the benefits case, particularly safety, and on how further improvements could be delivered for customers. The need for 'user support' should be replaced by objective analysis that would be presented to the CAA for approval.

Traffic risk sharing mechanism and price profiling

The CAA have not proposed a specific mechanism for the sharing of traffic risk but noted the possibilities of using the same mechanism that is used in Europe (and is adopted for the UK domestic en route service). The CAA have also not adopted price profiling.

The CAA are seeking views through consultation on (a) whether or not traffic risk sharing should be introduced for the oceanic service and (b) whether or not price profiling should be used. It does not provide any evidence or impact analysis either for or against these options.

Traffic volume risk sharing

- › Without a traffic volume risk sharing mechanism, variances in revenue caused by changes in oceanic traffic levels represent a material risk to the oceanic service. This is because traffic volumes are uncertain, but the oceanic service has high levels of fixed cost. A 3% reduction in traffic would reduce core (non-data) revenues by around £800k pa, thereby eliminating the equity component of NERL's oceanic return allowance.
- › In order to partially mitigate this risk, we propose that the CAA adopts the same traffic risk sharing mechanism for the element of NERL's prices which relate to core (*non-data*) cost that is used for the en route service. This would give a degree of protection to the oceanic service.
- › We do not propose applying the volume risk sharing mechanism to data costs, because, as described above, and in the absence of pass through for data costs, we would enter into a variable cost contract with Aireon (such that our revenues and our costs, both based on an underlying \$40 per flight hour data charge, would both increase or reduce *directly* in line with changes in traffic volumes). In this case, the application of the en route traffic volume risk sharing mechanism to data costs would create an exposure for us.

Price profiling

- › If prices were profiled (i.e. a smooth reduction across each year), this would lead to differences between revenues and determined costs each year and create a lack of transparency relating to the financial performance of the oceanic service. It would also make it more complex to implement a traffic volume risk sharing mechanism. For this

reason we propose that prices are established by dividing projected costs by projected traffic each year, without price profiling.

13.4. Additional comments on charging basis and Tango routes

The CAA proposes changing NERL's Licence to allow greater flexibility in the setting of charges in the south east corner (i.e. in relation to Tango routes). The aim is to ensure that any differential charging should reflect the differences in the cost of providing air traffic services within oceanic airspace.

We welcome the CAA's view but seek confirmation by the end of April 2019 that the specific charging proposals offered by NERL (set out below) are acceptable to the CAA. This is particularly important as we are changing our billing system to accommodate the new basis of charging and need to finalise certain aspects of this as soon as possible.

Our proposed basis of charging for oceanic services in RP3 is to:

- › Create two charging zones, one for Tango routes and another for North Atlantic Crossings (i.e. charges that apply to all flights that spend *any* time outside of Tango routes T9 and T290).
- › Charge the same core charge (i.e. excluding data costs) to customers in each zone, but apply a different data charge in each zone (reflecting the material difference in costs for satellite data in each area).
- › Charge a fixed fee per flight for both zones, and for both types of charge (core and data), which does not vary by time or distance flown in the oceanic airspace.

Appendix A: Further information about the NERL and STATFOR traffic forecasts

NERL provides details below of the NATS December 2018 traffic forecast and the STATFOR February 2019 traffic forecast as well as details of methodology discussions between NERL and STATFOR.

NATS December 2018 traffic forecast

UK air traffic movements (ATMs) are made up of a number of different types of movements: passenger, overflights, cargo, business and military. The factors that affect each of these are different and, therefore, each needs to be considered separately in the forecast before being combined to give the total UK ATMs.

Flights can also be broken down into market segments based on which markets they serve. These are: domestic (around 15% of flights), transatlantic and non-transatlantic arrivals and departures (6% and 64% of flights respectively), transatlantic and non-transatlantic overflights (9% and 6% of flights respectively).

Our forecasting methodology covers a number of different elements, which are then combined to produce the ATM forecast. Two forecast methods are used:

- › A passenger allocation model (PAM) for scheduled, chartered, and low cost operations.
- › Statistical techniques for overflights, cargo, business flights and military operations that are forecasted separately outside of the PAM.

In August 2017 we acquired the Department for Transport's (DfT) aviation forecasting model. This is a comprehensive model developed and maintained by the DfT to support production of forecasts for passengers, aircraft movements and CO2 emissions at UK airports. The model was used extensively in the Airports Commission's analysis to appraise capacity options and during this time the model was extensively peer reviewed. This model is used by our analytics team, together with updated assumptions set out in this document to forecast traffic movements for UK arrivals/departures.

For over 20 years, as an input to our forecasts, we have used economic forecasts provided by Oxford Economics. We produce one forecast each year, with the base forecast typically released around December. High and low variants of the forecast are produced early the following year.

This methodology allows a UK ATM forecast to be created, along with forecasts for en route service units (SU), the mechanism through which flights are charged for the air traffic service. SUs are a function of a flight's weight and great circle distance through the UK. Two SU forecasts are created; these cover chargeable service units (CSU) and total service units (TSU) – made up of CSUs and civil and military exempt flights.

The NATS December 2018 base case forecast represents the most likely scenario and is based on the Oxford Economics central economic forecast along with NATS' assessment of the most likely evolution of other influencing factors.

The main assumptions that are included in the forecast are the following:

- › Actual Traffic - January to November 2018
- › GDP assumptions
- › Other Economic assumptions – UK consumption, airline fares model incorporating airline fuel, carbon and other costs
- › Airport Capacities
- › Route level load factors
- › Overflights
- › Cargo
- › Service units calculated for each market segment.

Actual traffic

Actual traffic data for January to November 2018 is included in the NATS 2018 Base forecast. Traffic for remainder of 2018 was estimated using profiling methods. Detail of the actual traffic for January to November 2018 is given in Section 3.

In late February and early March 2018, the UK was hit by a series of snow and storms. This resulted in a number of days of flight cancellations at airports in the UK. Whilst no change has been made to the 2018 historical data, the 2019 growth rates have been adjusted to account for these cancelled flights.

GDP

While UK GDP is not directly correlated with traffic growth, GDP continues to be a significant driver of passenger and traffic growth. The Oxford Economics November 2018 GDP forecasts have been used in this forecast.

UK GDP is forecast to be 1.3% for 2018 and 1.7% in 2019; this is forecast to increase to around 2% p.a. for the duration of RP3. This is an upward revision for 2019 from the 1.5% UK GDP growth used in the August 2018 base forecast. The outlook for 2019 has been boosted by a loosening of fiscal policy announced in the Budget on 29 October, however there are still continued uncertainties around Brexit, rising oil prices and on-going trade tensions between the US and China.

In addition to the UK GDP, GDP forecasts for Europe, OECD (dominated by the US), Newly Industrialised Countries (NIC) (dominated by China and India) and Less Developed Countries (LDC) are also used in the forecast. The GDPs used in the NATS December 2018 Base forecast are given in the table on the next page.

Table 6: Oxford Economics November 2018 forecast GDP growth for RP2 and RP3

	2018	2019	2020	2021	2022	2023	2024
UK	1.3%	1.7%	2.0%	2.2%	2.0%	1.9%	1.7%
Western Europe	1.9%	1.7%	1.7%	1.7%	1.6%	1.4%	1.4%
OECD	2.4%	2.0%	1.7%	1.8%	1.8%	1.7%	1.7%
NIC	4.6%	4.4%	4.0%	4.1%	4.0%	3.9%	3.8%
LDC	3.4%	2.6%	3.7%	3.7%	3.9%	4.1%	4.2%
Interliners	2.6%	1.7%	1.5%	1.5%	1.5%	1.4%	1.2%

Economic uncertainty

There are a number of factors that could affect our traffic forecast. In particular, there is significant uncertainty related to economic forecasts for 2019-2024, affecting our RP3 plan. This is particularly the case with the current unknowns around Brexit and the effect this may have on the UK economy over the coming years. While the full effects of Brexit are unlikely to be understood prior to the start of RP3, the progress of negotiations over the next few months could give significantly more information about the nature of Brexit and its possible impact on the UK economy. In these circumstances, we would look to the CAA to keep the forecast under review given the higher degree of uncertainty.

Oxford Economics' baseline GDP forecasts reflect what they consider to be the most likely outcome. Risks, such as a UK recession or a global trade war, are not considered to be the most likely outcomes. Therefore, these are not included in the Oxford Economics baseline GDP forecast. Should the likelihood of such risks increase sufficiently then the baseline forecast would be updated to include these.

Other economic assumptions

The forecast for UK consumer spending growth is taken from the Oxford Economics July forecast.

The model includes an airline fares component which incorporates airline fuel, carbon and other costs.

The airline fares module forecasts air fares by modelled market. It breaks out the components of fare into:

- › fuel costs
- › carbon costs
- › Air Passenger Duty (APD)
- › Airline 'other' costs.

Fuel is a considerable operating cost for airlines and hence impacts their ability to service passenger demand. The model assumes a representative hedging strategy across the sector which better reflects airline practices, resulting in a profile of fuel cost forecast changes that are more robust. For the December forecast, using the Oxford Economics November forecast, oil

price is forecasted to be at \$74.13 for 2018 and \$76.50 in 2019; this is forecasted to continue rising up to \$81.11 at the end of RP3. This represents a small decrease in the short term compared to the oil price forecast used in the August 2018 base forecast of \$75.33, \$77.00 per barrel for 2018 and 2019 respectively and ends RP3 at the same price of \$81.11 per barrel.

Carbon costs included in the fares model are in line with the UK Department for Business, Energy and Industrial strategy March 2017 values.

Airline other (non-fuel) costs are calculated as the difference between the quantified components of airline costs and the air fare.

Air passenger duty (APD) is based on HM Revenue and Customs April 2017 APD and is assumed constant through the forecast.

Airport capacities

Airport capacities, both terminal passengers and runway, are a key constraint on the translation of passenger demand into flights. This forecast utilises intelligence from airport master plans and NATS Analytics' Airports and Consultancy team to determine future airport capacities. The tables below details the forecast growth in airport capacities to the end of RP3 at LTMA airports, and for other key UK airports and airports with strong growth respectively. These airport capacities are unchanged from those used in the August 2018 base forecast.

Table 7: Base Forecast Growth in Airport Capacity at LTMA Airports

[Redacted]

Table 8: Base Forecast Growth in Airport Capacity at Other UK Airports

[Redacted]

No additional runways are assumed for the full period of the base forecast, as a third runway at Heathrow airport will not be in place until the mid-2020s. Therefore, this is unlikely to impact on the traffic forecast during RP2 and RP3, though our plan needs to prepare for the expected increase in traffic generated from a new runway in early RP4.

The 5% increase at Heathrow airport comes from an anticipated increase in capacity due to on-going improvement projects such as TBS and e-TBS. Stansted has recently been granted approval to increase passenger numbers from 35mppa to 43mppa, however this will be achieved through increased wide body aircraft and will be within their current agreed ATM cap. Recent reports about the use of the emergency runway at Gatwick as a second runway are not included in any of the December 2018 forecasts.

The constraints of airport capacities, particularly in the LTMA where the passenger demand is the highest, will restrict the potential growth of ATMs.

Load factors

Load factors are a key variable in determining growth in air traffic movements (ATMs). The PAM includes load factors for individual routes over the entire forecast horizon. The table below gives an overview of average load factors by market. The load factors used in the December 2018 base forecast are unchanged from those used in the August 2018 forecast.

Table 9: Average Load Factor by Market

Market	Load Factors	Comment
WE	~85%	Higher load factor as a result of higher proportion of LCC
Domestic	~75%	Load factor consistent with a large proportion of legacy carriers
OECD	~75%	
NIC	~75%	
LDC	~75%	

Load factors remain at or near record highs. This means that load factors are less likely to absorb passenger growth than they have in past years and hence lead to increased air traffic movements (ATMs). This presents an upside risk. Conversely if passenger growth declined load factors could absorb this rather than ATMs being reduced.

Overflights

Overflights are split by transatlantic and non-transatlantic, which in Jan – Nov 2018 accounted for 9.4% and 6.1% of all flights respectively. The table below provides a comparison between the August and December 2018 base overflights forecasts across RP3.

Table 10: Forecast change in Overflights across RP3 (2020-2024)

Market	Aug18	Dec18
Transatlantic Overflights	3.4%	3.7%
Non-Transatlantic Overflights	7.0%	7.2%
Total Overflights	5.0%	5.2%

Cargo

Cargo flights typical account for 1% of UK FIR flights. The table below gives the forecast growth in cargo flights for each market over RP3. Cargo overflights are included in the Overflights forecast.

Table 11: Forecast Average Annual Growth in Cargo Flights across RP3 (2020-2024)

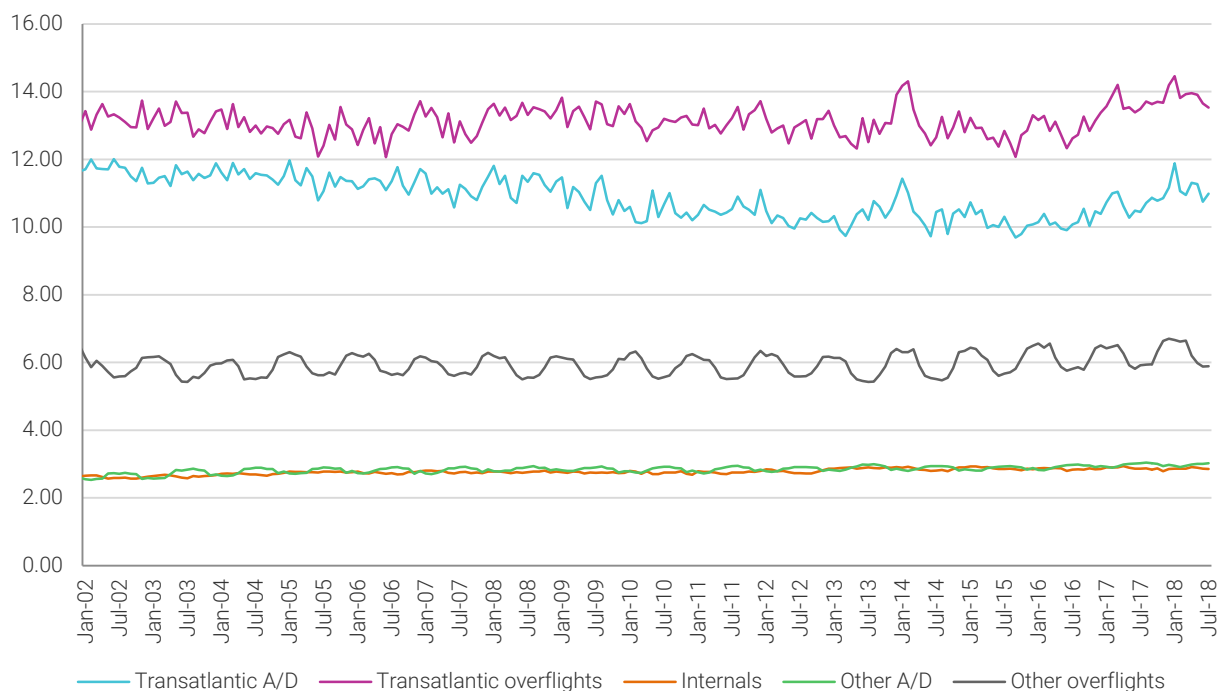
Market	Aug18	Dec18
Domestic	1.8%	0.9%
North America	1.4%	1.2%
Western Europe	0.6%	1.0%
Rest of World	-0.1%	0.0%
Total	1.1%	1.0%

In recent years the growth of cargo flights has slowed as a result of the increase in 'belly freight' on passenger flights.

Chargeable Service Units

Forecast Service Units are calculated for each market segment due to the variations in the number of CSUs per flight. The figure below shows the historical variation in average CSUs per flight for each market segment.

Figure 3: CSUs per flight



Average CSUs per flight are lower and stable for Non-transatlantic arrivals/departures and domestic as a result of the shorter distances flown for these routes. Other overflights show seasonal variability due to the variation in European destinations from Ireland but have a relatively stable annual average.

The Transatlantic arrivals/departures and overflights have much higher CSUs per flight, these flights typically account for only 15% of flights but around 40% of service units. There is also variation in the average CSUs per flight for these market segments as a result of distance flown through the UK FIR due to the location of the jet stream and NAT Tracks. When the NAT Tracks are more northerly, longer distances are flown through the UK FIR. Similarly to 2016, 2017 and early 2018 saw more northerly routings, particularly when compared with 2015 when south-about tracks dominated the year. Since mid-2018 the tracks have started to move further south.

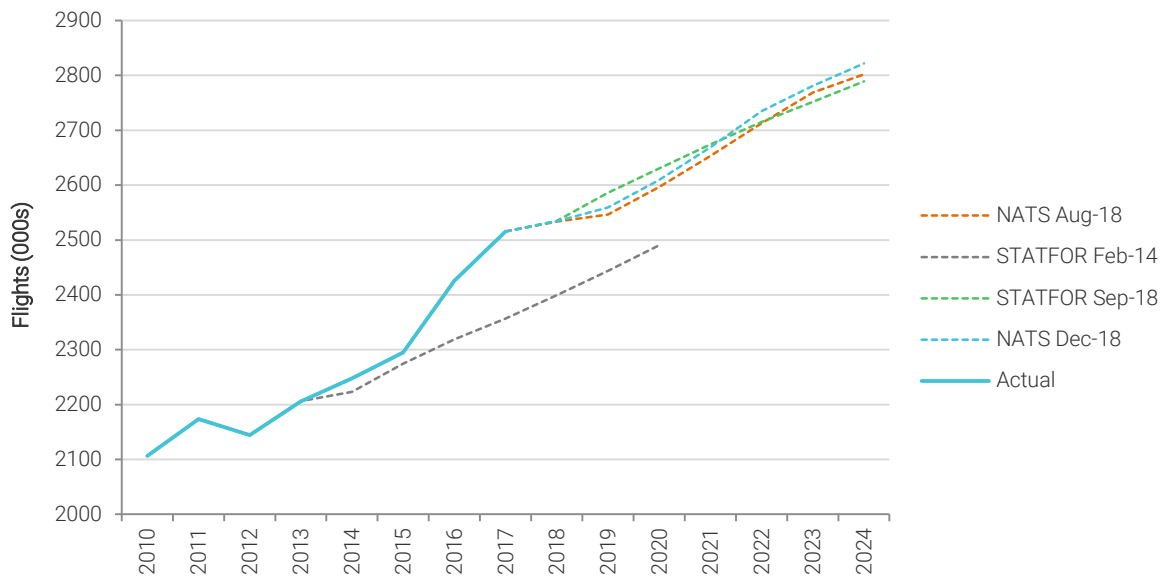
As advised by the UK MET Office, to account for the annual variation in the location of the jet stream, and its impact on distances flown in the UK FIR, a rolling five-year average profile of CSUs per flight is used in the CSU forecast for Transatlantic arrivals/departures and Transatlantic overflights.

NATS December 2018 Base Forecast Results

UK flights

The figure below shows the NATS December 2018 base case UK FIR flight forecasts alongside the NATS August 2018 base, STATFOR September 2018 and STATFOR February 2014 (RP2) forecasts for comparison.

Figure 4: UK flights forecast



In 2018 January - November UK FIR flights have grown by 0.7%, while over the same period in 2017 we saw traffic growth of 4.0%. The December 2018 base forecast expects growth for 2018 to be 0.7%.

Our December 2018 base forecast projects UK flight growth of 1.0% for 2019. This is a very slight increase of 0.5% against the August 2018 base case, in part due to an upward revision in GDP growth in 2019.

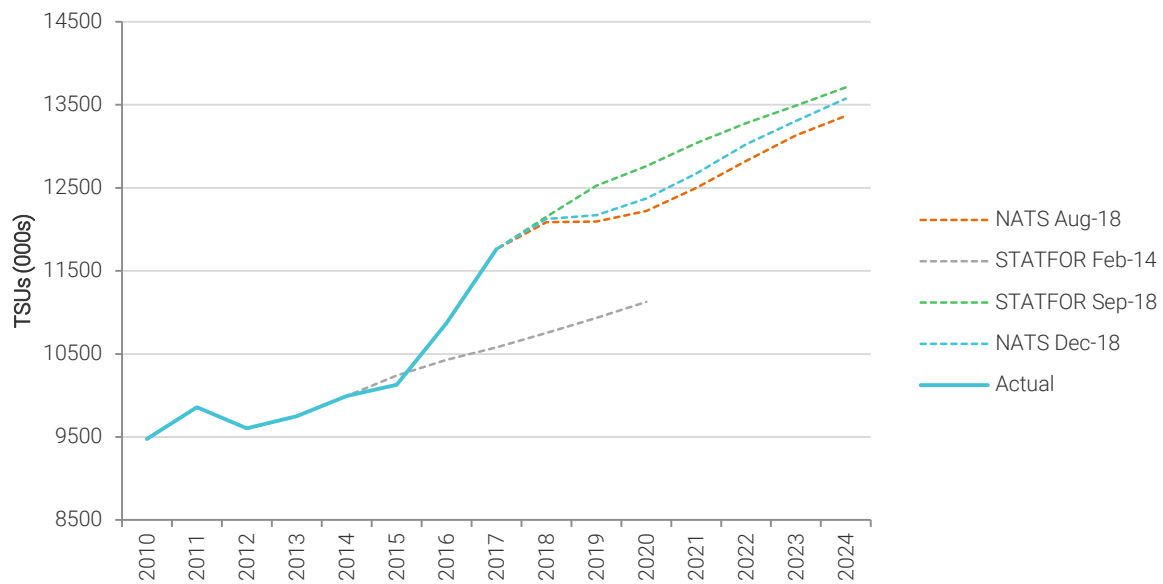
Over RP2, our December 2018 base forecast projects growth of 13.9%, with the total number of flights being 4.5% and 0.1% higher over RP2 against the STATFOR February 2014 and August 2018 forecasts, respectively.

Over RP3, our December 2018 base forecast projects growth of 10.2%, which is 0.4% and 0.6% higher in comparison to the STATFOR September 2018 and August 2018 forecasts, respectively.

Total Service Units

The figure on the next page shows the Total Service Units (TSUs) forecast from the NATS December 2018 base case forecast along with the STATFOR September 2018, NATS August 2018 base and STATFOR February 2014 (RP2) forecasts for comparison.

Figure 5: UK TSU forecast



TSUs grew by 8.2% in 2017. This strong growth, which was more than the increase in flights, was a result of growth in the transatlantic market segments combined with more northerly NAT routings resulting in longer distances being flown.

For January to November 2018 TSUs grew by 3.5% due to more northerly North Atlantic tracks in the early part of 2018. Recently the growth rate of TSUs has slowed as the North Atlantic tracks are returning to a more central position. Our December 2018 base case forecast expects TSU growth for 2018 to be 3.1%.

Moving ahead to 2019, we are expecting that TSUs will increase by 0.4%, this low growth is a result of the subdued flights forecast for 2019 along with the expectation that the North Atlantic tracks will begin to return to a more central position, this equates to a 0.6% increase in forecasted TSUs when compared to the August 2018 forecast.

Over RP2, our December 2018 base forecast projects TSU growth of 21.8%, which is 7.8% and 0.2% higher than the STATFOR February 2014 and August 2018 forecasted projections for the same period, respectively.

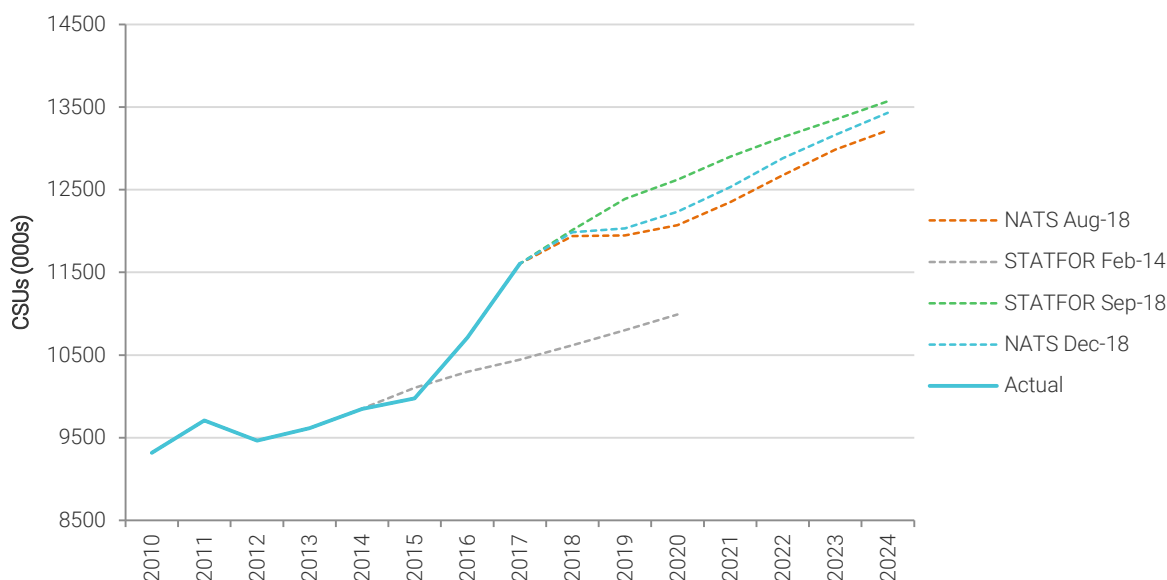
Over RP3, our December 2018 base forecast projects growth of 11.5%, which is 1.4% higher in comparison to the August 2018 forecast but 2.0% lower than the STATFOR September 2018 forecast for the same period.

We expect growth in TSU volumes during RP3 to be higher than the growth in flight numbers. This is because we are forecasting stronger growth in transatlantic market segments, specifically overflights, which have a larger number of TSUs per flight and are not constrained by UK airport capacities. Our forecasted growth is lower than STATFOR due to variations in methodology, where our forecast uses a five year average to forecast Service Units STATFOR anticipates a continuation of the strong growth seen in recent years.

Chargeable Service Units

The figure below shows the UK Chargeable Service Units (CSUs) forecast from the NATS December 2018 forecast along with the STATFOR September 2018, NATS August 2018 and STATFOR February 2014 (RP2) forecasts for comparison.

Figure 6: UK chargeable service units forecast



In 2017 CSUs saw strong growth of 8.4%; similarly to TSUs this was more than the increase in flights as a result of stronger growth in the transatlantic market segments combined with more northerly NAT routeings leading to longer distances being flown. For January to November 2018, CSUs grew by 3.7% due to more northerly North Atlantic tracks in the early part of 2018. In recent months the growth rate of CSUs has slowed with North Atlantic tracks beginning to return to a more central position, we are expecting CSU growth for 2018 to be 3.3%.

Our December 2018 base forecast projects that CSUs in 2019 will increase by 0.4%. This low growth is a result of the subdued flights forecast for 2019 along with the expectation that the North Atlantic tracks will begin to return to a more central position, this equates to a 0.4% increase in forecasted CSUs when compared to the August 2018 forecast.

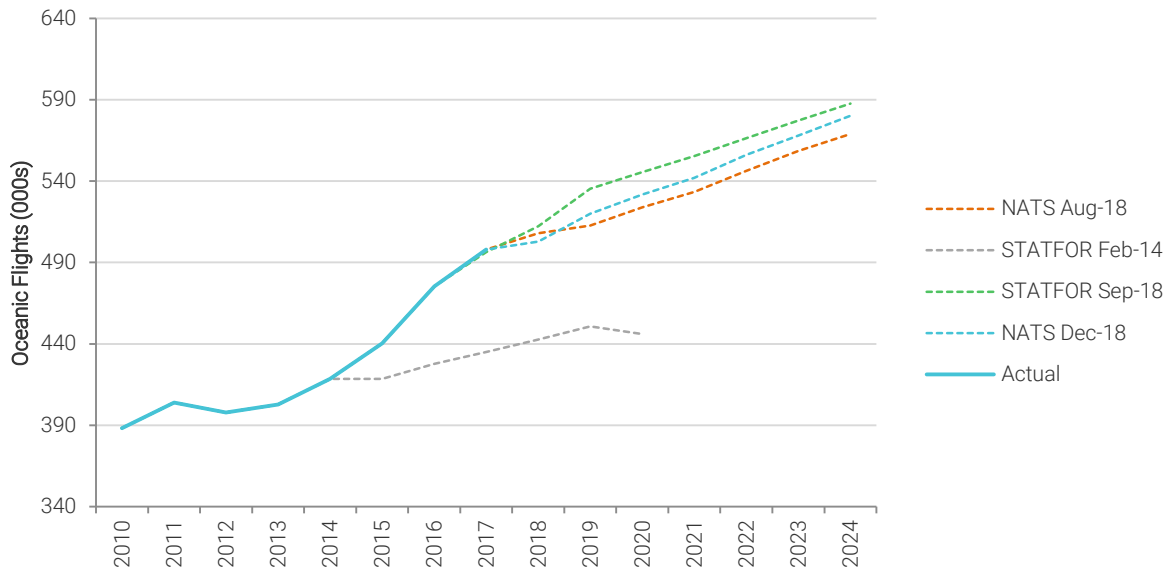
Over RP2, our December 2018 base forecast projects CSU growth of 22.2%, which is 7.7% and 0.2% higher than the STATFOR February 2014 and August 2018 forecasts for the same period, respectively. Over RP3, our December 2018 base forecast projects CSU growth of 11.6%, which is 2.0% lower and 1.5% higher in comparison to the STATFOR September 2018 and NATS August 2017 base forecasts, respectively.

The expected growth in CSU volumes during RP3 is higher than the expected growth in flight numbers. This is because we are forecasting stronger growth in transatlantic market segments, in particular overflights, which have a larger number of CSUs per flight and are not constrained by UK airport capacities. Again, our forecasted growth is lower than STATFOR due to variations in methodology, where our forecast uses a five year average to forecast Service Units STATFOR anticipates a continuation of the strong growth seen in recent years.

Oceanic flights

The figure below shows the oceanic flights forecast according to the NATS December 2018 base case forecast along with the STATFOR September 2018, STATFOR February 2014 and NATS August 2018 base forecasts for comparison.

Figure 7: Oceanic flights forecast



In 2017 oceanic flights grew by 4.7%. This was the result of strong growth in the transatlantic market segments.

Oceanic flights increased by 0.7% in January – November 2018, despite a 4.9% decline in January 2018 as a result of flight cancellations in the US during storm Brody. By the end of 2018 we expect oceanic flights to have increased by 1.0%.

Our December 2018 base forecast projects oceanic flights in 2019 will increase by 3.4%, this reasonably strong growth partly due to the upward revision to the GDP forecasts and strong growth seen through the second half of 2018. This equates to a 1.4% increase in forecasted flights when compared to the August 2018 forecast.

Over RP2, our December 2018 base forecast projects oceanic flight growth of 24.3%, which is 12.0% and 0.1% higher than the STATFOR February 2014 and August 2018 forecasted projections for the same period, respectively. Over RP3, our December 2018 base forecast projects oceanic flight growth of 11.6%, which is 1.9% lower in comparison to the STATFOR September 2018 forecast but 1.7% higher when compared against the NATS August 2018 base case forecast.

The table on the next page gives the oceanic flights forecast split between North Atlantic crossing and Tango (including north/south) flights.

Table 12: Oceanic forecast for North Atlantic core and Tango flights

	North Atlantic Core	Tango (inc N/S)	Total	% GR
2020	501	31	532	2.3%
2021	510	32	542	1.9%
2022	522	34	556	2.6%
2023	533	35	568	2.1%
2024	544	36	580	2.2%
2025	556	37	593	2.2%

STATFOR February 2019 forecast

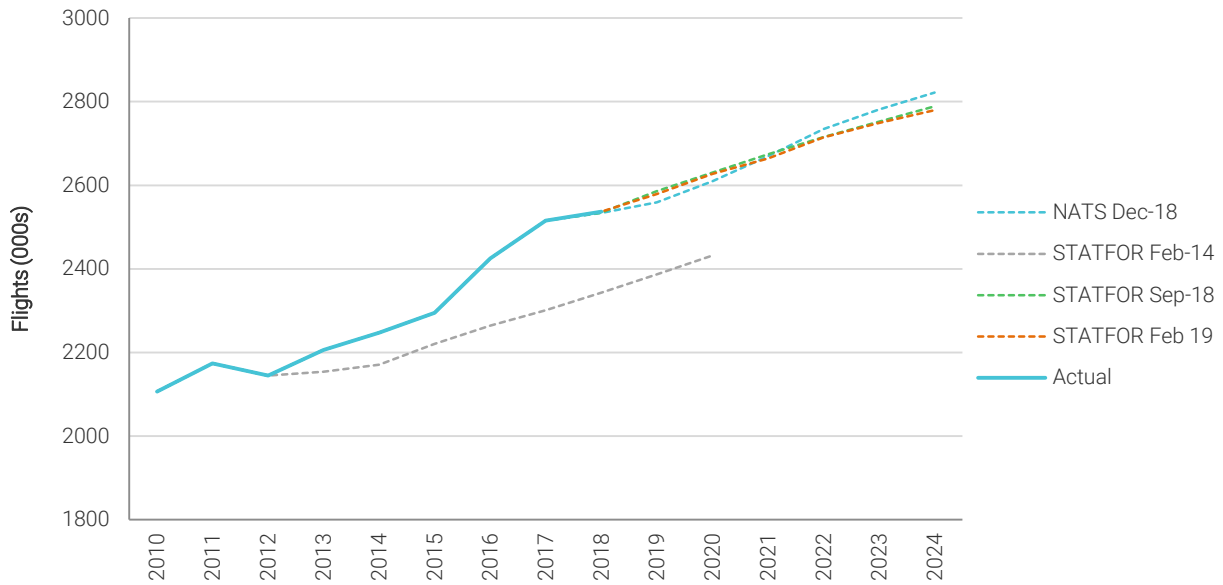
The latest Eurocontrol STATFOR seven-year forecast (February 2019) was issued on the 21st February. A key input to the STATFOR forecast is Oxford Economics' January 2019 UK GDP forecast, as shown in the table below. Our December forecast, which was produced two months earlier, uses Oxford Economics' November 2018 UK GDP forecast which is not materially different from the GDP forecast used in the STATFOR February 2019.

Table 13: Oxford Economics January 2019 forecast GDP growth for RP2 and RP3

	2018	2019	2020	2021	2022	2023	2024
UK	1.4%	1.7%	2.0%	2.1%	2.0%	1.9%	1.7%

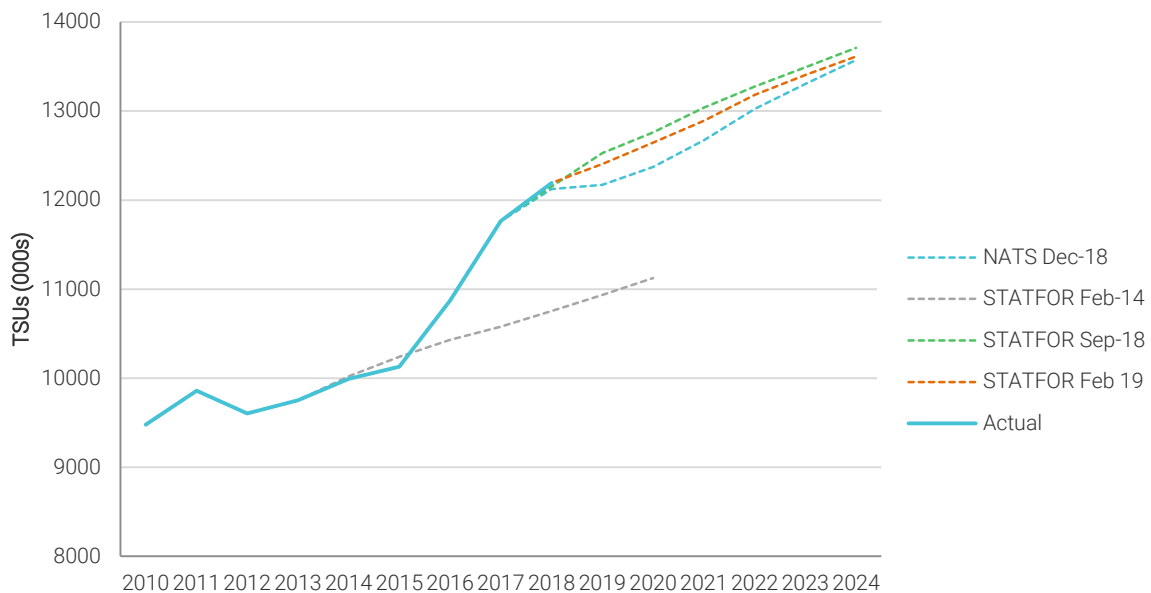
The STATFOR February 2019 UK flights forecast is shown in the figure on the next page, along with our December 2018 base forecast and the STATFOR September 2018 base forecast for comparison. STATFOR expect growth in UK flights of 1.7% in 2019, with growth of 14.6% over RP2 and 7.8% over RP3. The STATFOR forecast for UK flight numbers is 0.2% lower than our flight forecast by the end of RP3. However the STATFOR 2019 growth is considerably higher than in our forecast. Over RP3 the STATFOR February 2019 forecast projects 0.7% fewer flights than our December 2018 forecast, this represents a return to a more normal relationship between the forecasts given that the STATFOR forecast methodology does not reallocate excess passenger demand once airports reach capacity.

Figure 8: STATFOR February 2019 UK Flights forecast



The STATFOR February 2019 TSU forecast is shown in the figure below along with our December 2018 base forecast and the STATFOR September 2018 base forecast for comparison. STATFOR projects TSU growth of 1.8% in 2019, with growth of 24.3% over RP2 and 9.7% over RP3. The STATFOR February 2019 forecast for TSUs is 1.2% higher than our forecast by the end of RP3. This is the result of higher STATFOR 2019 flight growth and continued higher TSU per flight assumptions. This gap between the STATFOR and NATS forecast is worth £35m over RP3, and is equivalent to 32% of NERL's equity return allowance.

Figure 9: STATFOR February 2019 TSU forecast



Commentary on STATFOR

Within the STATFOR report that accompanies their forecast, STATFOR highlight the downside risks to the flight and TSU forecasts, particularly the Brexit uncertainties. They also note that an increase in aircraft size and increases in load factors may also reduce the rate of flight growth.

There are a number of differences in the forecast methodologies used by STATFOR and us. One of the main differences is that, unlike our model, STATFOR's PAM does not reallocate passengers to alternative airports if their nearest airport reaches capacity. We believe that the inclusion of passenger reallocation in PAM makes our forecast more realistic for the UK.

In addition to the differences in the methodologies for forecasting flights, there are also differences in the methodologies used to forecast TSUs. These are covered within the 'Discussions with STATFOR' section.

Discussions with STATFOR

2019 STATFOR growth

UK GDP forecasts used in NERL Dec18 and STATFOR Feb19 traffic forecasts are closely aligned. However, the STATFOR forecast projects growth in flights of 1.7% for 2019 compared to NERL's December flight forecast of 1% for 2019. Given that only 0.9% flight growth was seen in 2018 and UK GDP is continuing to slow, STATFOR's traffic forecast for 2019 appears implausible.

STATFOR have acknowledged the wider uncertainties for international traffic from and to the UK, linked to Brexit. They have observed that 2018 flight growth appears low compared to previous years and that the relationship in that year between UK GDP growth and flight growth might be anomalous.

We consider that the combination of global economic uncertainty (trade tensions), the asymmetric risk from Brexit, reductions in the growth of low cost carriers, and record load factors all point to a general slowing in growth in flights. For these reasons we believe our forecast to be more plausible.

The CAA appeared to support our view at the STATFOR user group in January 2019, when their representative observed that the consensus GDP forecast of 1.4% for 2019 is lower than the Oxford Economics forecast of 1.7% (used by STATFOR). He said that this might explain the "high feeling" that the CAA have that STATFOR's forecast is overstated for 2019-2022.

Transatlantic chargeable distance

STATFOR have considered evidence that NATS has presented on the position of the jet stream. STATFOR recognise that the location of the jet stream affects the chargeable distance flown for the UK and therefore influences the service unit forecast. STATFOR are content that a return to the long-term average position of the jet stream (see figure on the next page) is a fair assumption for the RP3 forecast and have taken account of this to the limits permitted by their model, as explained below.

Figure 10: STATFOR average chargeable distance



The STATFOR forecast model uses three market segments (arrival/departures, overflights and internal flights). Transatlantic markets are not separated from these segments and it is not possible for the chargeable distances of the transatlantic flights to be adjusted directly in the STATFOR model to reflect the position of the jet stream. Therefore, STATFOR have only been able to adjust the chargeable distance for the overflight market segment using a time series for chargeable distance that most closely reflects the long-term average position of the jet stream. While this approach more closely aligns STATFOR's forecast with the NATS forecast, the STATFOR forecast is still overstated because the market segment for arrivals/departures is not similarly adjusted for the transatlantic arrivals/departures.

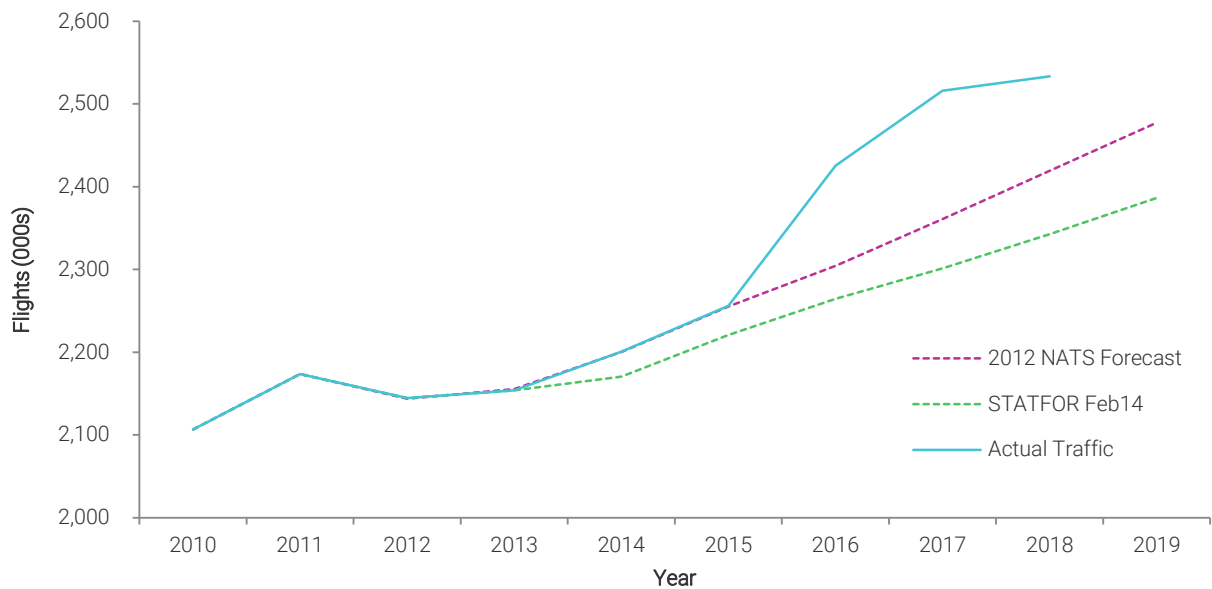
Chargeable distance

The STATFOR TSU forecast methodology further differs from NATS methodology. STATFOR develop an initial TSU forecast using "occupancy distance" as a proxy and then use a weighted average to derive their final TSU forecast to reflect chargeable distance. NATS simply uses CRCO chargeable distance data to produce its TSU forecast. This more direct approach is more accurate.

Comparison of RP2 forecasts

To further support our view that our better knowledge of UK airspace and of local factors provides a better basis for planning than STATFOR's, the figure on the next page shows a comparison of our RP2 forecast to STATFOR's. This shows that our 2012 forecast (used for the RP2 customer consultation) was closer to the actual outturn of traffic in RP2 than the STATFOR Feb-14 forecast.

Figure 11: Comparison of RP2 forecasts



For the reasons given above, we believe that our traffic forecast is more appropriate for the UK.

There continues to be considerable uncertainty around the current forecasts.

The forecast is sensitive to:

- › Risks to economic growth in the UK and Eurozone
- › Weaker growth in the low cost segment
- › Changes in airline route choices
- › Higher oil prices
- › Airline market changes
- › Airport capacity.

We will continue to monitor the assumptions and will update the forecasts for the CAA for the latest economic projections from Oxford Economics. If there is any material change, then we will submit our next forecast in May 2019.

Appendix B: Further information about NERL's proposals to exempt flights beyond its control for the 3Di metric

NERL provides further evidence below for its proposals for 3Di only being measured in relation to factors that are under its control.

Lower altitude airspace

NERL proposed that the lowest levels of airspace were no longer captured by the 3Di metric in order to:

- › Improve our focus on the fuel saving initiatives we can affect; better reflecting NERL performance and giving us more accountability for the airspace we control.
- › Avoid windfall gains or losses.
- › Avoid controllers losing faith from seeing the things they can't affect changing the the score.

More information about NERL's rationale for excluding lower airspace is provided below.

- › Without the NERL proposed vertical cut-off, 3Di will erroneously capture the impact of other parties. The wholesale re-design of airspace for FASI-S airports (and interim changes) during RP3 is expected to significantly impact flight profiles below 7,000ft (at least). This includes changes at Heathrow, Gatwick, Stansted, Luton, London City, Northolt, Farnborough, Biggin Hill, Southend, Bournemouth, Southampton, Cardiff, Bristol, Birmingham and East Midlands airports. NERL's RP3 Business Plan also provided examples of airports such as Manchester, Edinburgh and Liverpool developing new airspace arrangements to over 11,000ft. Between now and the end of RP3 we also further anticipate impacts to flight profiles from airport led developments at Heathrow (introduction of Independent Parallel Approach's), Leeds, Doncaster, Newcastle, Prestwick and Glasgow airports. The scope of many of these developments goes beyond 7,000ft, impacting routes up to/from Flight Level 160.

With almost half of the current UK 3Di score coming from flights below 9,000ft for departures and below 7,000ft for arrivals NERL is at significant risk of being unfairly measured based on the changes initiated by others. Especially since UK policy now makes noise a priority below 7,000ft - we expect that measures to mitigate noise (e.g. longer routes to avoid populations, respite routes, airspace alternation) will rightly be prioritised over fuel burn efficiency – at the detriment to 3Di. This is evident in the emerging airspace envelopes in the current Heathrow airport consultation on R3 and IPA. Even if an airport improves efficiency this should not be reflected in NERL's performance scheme. The CAA have not recognised this point within their NPP.

- › NERL's Business Plan also described how experience gained through RP2 had shown that 3Di is affected by day-to-day factors outside our control. Airport operator decisions and operational factors have been found to significantly impact scores; airport schedules and scheduled arrival holding, airport growth, capacity or delay priorities (e.g. prioritisation of departures on runways at the expense of arrival holding). The elected runway in use, which

is primarily based on wind direction, has even been found to significantly impact 3Di scores. Our analysis of 2018 performance shows that the impact from an unprecedented number of easterly operating days increased the national average 3Di by 0.4 points. Put another way, had the instances of easterly operations been similar to historical/typical levels the NERL year end 3Di score for 2018 would have been 0.4 points lower. Re-calculating 3Di for 2018 with the proposed vertical cut-off applied reduces this effect (abnormally high number of easterly days) to just 0.04.

- › The NERL proposal was also made in response to CAA guidance (CAP1511 and 1593) to mitigate the potential for fuel efficiency improvements (e.g. procedures changes) adversely impacting noise. The CAA have concluded in the NPP that '3Di already implicitly captures the trade off through its vertical component'. This is factually incorrect. Noise is a function of both the horizontal placement of ground tracks and the vertical profile of flights (impacted by the constraints added or removed through airspace re-design). 3Di is influenced by the additional track distance flown (ground track placement) and any vertical level-offs (again effected by structural constraints) – both influenced by airspace design led by local airports.
- › Outside of London Terminal Control flight profiles near to airfields are managed by NATS Services or other ATC providers and should not therefore be reflected in NERL performance measurement.

If the CAA wish to identify the overall impact of modernisation on 3Di and retain a view of the overall 3Di network performance it should do this using a side tracking Performance Indicator and set financial incentives only on the scope of 3Di that reflects NERLs performance.

Other factors/events

The CAA recognise that there are factors not in NERLs direct control but still wish for the resultant impacts on flight efficiency to be attributed to NERLs performance.

In these cases it is wrong to suggest NERL can 'consider flight efficiency in responding to these factors'. For example, in the cases of severe thunderstorm activity and mass diversion scenarios safety criticality does not lead to choice (e.g. aircraft re-route themselves for thunderstorms). In other abnormal conditions such as runway closure or a system failure not related to NATS, we have limited or no scope to respond. 3Di data from past events at Heathrow airport has shown that the knock-on impacts can take a large part of the day to recover from, and influence the overall national average 3Di for those days. For example, i) a burst tyre leading to runway closure, ii) a mayday emergency leading to ground delay and holding and iii) a baggage system failure also leading to holding, have all been shown to increase the UK 3Di score to 33-35 points (vs normal average levels of 29 points).

Increased demand for air traffic beyond forecast growth rates (regards modulated targets) is not within our control – more aircraft will lead to more interactions in airspace and therefore more inefficiency. There are well known side effects when airspace becomes saturated for longer periods. If airline operators are experiencing regular delays in certain sectors they will find their own solutions by filing to avoid the congested sectors, with an inevitable consequence on the environmental performance (increased track extension by re-routeing). In a similar way, NERL may elect to use more RAD measures and/or re-route scenarios to force traffic away from the capacity "hotspots" with similar effect.

A change in data that includes airspace not managed by NERL within the scope of 3Di does not reflect a change NERL can respond to, or a fair reflection of NERL performance over time. This was evident during RP2 with the inclusion of Newcastle flights, not managed by NERL, within the 3Di score. It is very likely that expected changes to NERL systems (e.g. ARTAS, iTEC) may also impact on the scope of data ingested into the 3Di calculation. Such a change would also not reflect a change in NERL performance. NERL's latest assessment is that the change to a different radar processing system could increase the national 3Di score by 2 points.

The CAA should set targets only on the elements of 3Di that NERL can control, or make allowance in the target setting and performance scheme.

Appendix C: RP3 delay estimates without transition allowances

In this appendix, we describe the increases that will be necessary to the C1 and C2 score as well as the greater number of exemption days for C3 and C4, if the CAA are not minded to accept the transition allowance approach.

C2

In the table below, we provide our original estimates of C2 delay in RP3 (that assumed a transition allowance) with revised estimate (that assumes there is no transition allowance). We then propose revised targets in each year of RP3 (without a transition allowance), which provides an average C2 target of 20.4 seconds delay per flight each year (compared to our original proposal of 10.8).

Table 14: C2 targets with and without transition in RP3

Year	Transitions		Target	
	Description	Impact (delay in seconds per flight p.a.)	Original: with transition allowance	Revised: without transition allowance
2020	1 medium	3	10.8	12
2021	1 large, 2 medium	18	10.8	20
2022	2 large, 2 medium	18	10.8	20
2023	2 large	24	10.8	25
2024	2 large	24	10.8	25
Average			10.8	20.4

The revised C2 targets for RP3 without transition allowances have been estimated by taking the ExCDS transition as an example.

The ExCDS transition was acknowledged to be a successful transition by customers and other stakeholders including Eurocontrol. It caused around 250,000 minutes of delay in total, which equates to approximately 6 seconds. In RP3, we will deliver between 7 and 10 large transitions, some of which will be larger and more complex than ExCDS. In addition to these large transitions, there will be a number of smaller ones

Therefore, for each year of RP3, we have looked at the projects to be transitioned and quantified the expected delay based on how the scale of the transition into service compared to ExCDS. We have then also challenged ourselves in terms of the target to deliver a better service than our current estimate of the transition delay would suggest.

The numbers in the table are necessarily high level estimates that will be refined as the delivery programmes progress (which is why NERL would have preferred a transition allowance approach). There are potential changes arising from differences in implementation dates and traffic growth. Final transition arrangements are yet to be agreed and will be developed during the project lifecycle and consulted with customers in the lead up to the transition.

C1

The above numbers suggest that NERL's C2 target for RP3 should be raised from 10.8 to 20.4 on average. Applying an equivalent increase of 9.6 seconds to the original C1 target for RP2 with transition allowances of 13.8 seconds (or 0.23 minutes) suggests a revised C1 target without transition allowances of 23.4 seconds (or 0.39 minutes)

Exemption days

We had 75 exemption days for C3 in RP2 and delivered three large transitions (LAMP1A, PC Upper and ExCDS). To allow safe bedding-in of new airspace and technology with all controllers on all watches, transitions will typically last 20 days with the first 10 days running at capacity of around 80% normal and the second ten days running at 90% capacity. With ExCDS, the more complex transitions used an extra 10 day period of slightly reduced capacity. As a consequence of the lessons learned from ExCDS in RP2, we would plan similar for changes in RP3.

Given the number of major transitions in RP3 is planned to be between 7 and 10 with a number of extra smaller ones, we will need at least 150 exemption days to enable us to manage them effectively. Scaling up on the basis of RP2 would take us to a figure between 175 and 250. Therefore, we are challenging ourselves with this proposal of 150 exemption days to deliver a significant performance improvement above our current estimates.

Appendix D: ACOG costs

The Airspace Change Organisation Group (ACOG) will define and manage the overall airspace modernisation strategy for the UK. It will provide programme management support to ensure that all airports deliver at the same pace, and will undertake airspace change processes on behalf of airports. The ACOG will also comprise a technical support team to manage the operational interface resolutions between overlapping airspace designs, and a communications team to ensure coherent and credible public and industry consultation.

The DfT's Aviation Strategy recognises that it is critical that robust governance, together with adequate funding and resources are in place to deliver airspace modernisation. The DfT and the CAA have worked with NERL and the Infrastructure Projects Authority to design a new governance structure to oversee airspace modernisation, including the ACOG.

In 2018, NERL was formally requested by the DfT and CAA to establish and lead the ACOG. It will define and manage the overall airspace modernisation strategy for the UK. It will provide programme management support to ensure that all airports deliver at the same pace, and could undertake some airspace change processes on behalf of airports. The ACOG will also comprise a technical support team to manage the operational interface resolutions between overlapping airspace designs, and a communications team to ensure coherent and credible public and industry consultation.

The ACOG will be independent to NERL's airspace change team. The ACOG is being established in 2019, supported by funding from the FAS Facilitation Fund. A minimum of £15m in total (in 2017 prices) or £3m p.a. will be required to fund the ACOG in RP3. This is based on staff costs for a team of 18 FTEs, which will support the three work streams outlined below (excluding risk).

- › Programme management support: not all airports have large project management capability and ACOG will ensure that all airports deliver at the same pace. ACOG will have staff experienced in the delivery of projects and programmes and will be able to provide a high level of assurance and support to individual ACP Projects to ensure timely and comprehensive delivery.
- › Technical support: to manage the operational interface resolutions between overlapping ACP designs from Airport sponsors (ATCOs) and to ensure the quality of ACP submissions by all programme participants (airspace change specialists).
- › Communications: to ensure a coherent and credible public and industry coordination strategy through the life of the programme.

These roles¹² are critical to the successful delivery of the airspace modernisation strategy.

The above roles are supported by non-staff costs to cover access to experts on noise and legal issues, as well as required overheads such as communication materials, facilities management related costs, information solution costs and travel expenses.

¹² Include required levels of expertise in areas such as air traffic control, programme and project management, negotiation, customer relations, environmental concerns and communications.

A breakdown of these costs is shown in the table below.

Table 15: ACOG funding requirements

£m (2017 prices)	2020	2021	2022	2023	2024
Staff costs	2.0	2.0	2.0	2.0	2.0
Non-staff costs	1.0	1.0	1.0	1.0	1.0
Total core costs	3.0	3.0	3.0	3.0	3.0

Due to the complexity of the programme, and recognising the need to consult with 26-27 million people, we also estimate that around £3m-£5m p.a. of risk and contingency could be required, for example if repeat cycles of the CAP 1616 airspace change process need to be completed. As there are no certain requirement around the risk and contingency, we propose that the ACOG should be able to recover these costs from the opex flexibility fund via a recommendation from the ACOG to the programme sponsors for approval. In this instance, additional airline participation in the decision process would not be necessary, because airlines are part of ACOG. We consider this is an efficient way to fund the ACOG – establishing core funding for the essential elements and providing a measured approach to draw down of risk with transparency and stakeholder involvement.

The ACOG is necessary to avoid poor coordination and incomplete delivery of airspace modernisation. The LAMP Project has set targets of a 3 second (around 120,000 minutes per annum) reduction in delay and a saving of 90 to 180kT of fuel per annum across the FASI South Airspace. Using current fuel and schedule assumptions (including Runway 3), failure to deliver these two benefits would result in a cost to industry of between £4.5 and £5m per month for each month's implementation delay beyond the end of 2025.

Appendix E: Staff headcount in RP3: a response to Steer (NERA report)

This appendix, supporting our response to Chapter 5 of the NPP, is provided as a separate attachment.

Appendix F: Cost of equity for RP3 (NERA report)

This appendix, supporting our response to Chapter 7 of the NPP, is provided as a separate attachment.

Appendix G: Estimation of debt beta (report by Professor Ania Zalewska)

This appendix, supporting our response to Chapter 7 of the NPP, is provided as a separate attachment.